



## Corona Virus Echoes of Earth Grumbling: A Review

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### ABSTRACT

This article was written at the same time as the corona virus peaked in the country and during home quarantine, coinciding with the 40th day of the corona virus entering the country in April 2020, coincided with the Iranian new-year holidays. The purpose of writing this brief is to express sympathy with the earth and respond to her forgotten groans. A late but at the same time insignificant activity in the hope of healing the wounded conscience of inactive scholars such as current writers who hope to take positive action to preserve and protect the earth, the human ecosystem. The emphasis and purpose of this article is to exemplify national determination and mobilization in the fight against Corona for a higher purpose such as saving the earth and human life from catastrophe. In this regard, the teaching of environmental requirements in educational levels, the development of elite discourse in the framework of the formation of non-governmental organizations, and the use of scientific, cultural, and indigenous capacities as viable solutions have been proposed.

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## INTRODUCTION

Human beings need to consume energy to carry out their daily activities and to develop the amazing advances of industry. Moving the wheels of large factories and industries, developing land, air and sea transport fleets, managing business and world trade, agricultural and livestock products, conducting scientific research on land and ocean, mining and extraction of minerals, space travel and satellite exploration, military campaigns, and the management of civil wars and many more are all things that humans need to consume energy. The world's energy resources are categorized in three divisions: fossil fuels, nuclear energy, and renewable or clean energy.

Unfortunately, renewable or clean energy sources that do not pollute the environment account for only a small part of the world's energy consumption [1]. Renewable energy currently supplies only about 13% of the world's total energy consumption. Although strategic goals for the development of these energies have been formulated in at least 66 countries and the necessary policies have been made for the years 2010-2020, but increasing the production of this kind of energy and replacing them in the short term seems very unlikely. Figure 1 shows the global share of each type of energy

such as wind, solar, hydropower, bio and other energy sources in 2017.

Although nuclear energy has been widely criticized in recent years for its safety, cost-effectiveness, and environmental hazards from nuclear waste generation, it has been used as a source of energy in advanced industrialized countries. Nuclear energy is generated in certain reactors and then used in the production of steam to run turbines and generate electricity in massive generators. Nuclear power generation, like fossil fuels, generates waste, but nuclear waste is controlled and does

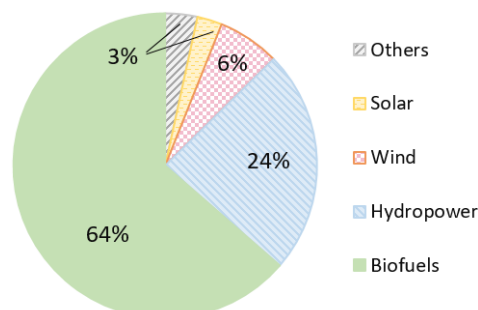


Figure 1. The share of clean energy in the production of total renewable energy in the world

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not spread on Earth. Nuclear energy, which is mainly produced and used in industrialized countries, is underdeveloped due to significant production costs, limited uranium resources, as well as safety and environmental considerations, and accounts for a small share of world energy production. The data in Figure 2 shows the share of each energy source in total world energy production for year 2017 [2]; the total share of both clean and nuclear energies is less than 20% and over 83% of the world's energy consumption comes from fossil fuels.

Therefore, the energy consumption at the moment, mainly related to combustion of fossil fuels. Fossil fuels include jet gasoline, ordinary gasoline, diesel, fuel oil, kerosene, furnace fuel and, in short, refined derivatives of crude oil, as well as coal and natural gas. Combustion of fossil fuels means combustion of hydrocarbons with oxygen to produce carbon dioxide. Incomplete combustion of fossil fuels, of course, produces other gases, including nitrogen and sulfur compounds known as  $\text{NO}_x$  and  $\text{SO}_x$ . It is common to call the set of gases produced in combustion of fossil fuels as greenhouse gases [3].

In this article, the catastrophic damages caused by global warming due to uncontrolled production of greenhouse gases<sup>1</sup> on ecosystems are examined and ways out of this global environmental problem are explored. In this regard, the environmental problems caused by global warming are briefly enumerated, and the inadequate activities of governments on the one hand and the inability of environmentalists and sympathizers to set up a global scan to deal with the unbridled consumption of fossil fuels on the other hand has been critically reviewed and the dangers of everyone's inattention to the future of the earth have been warned. Then, the favorable social environmental conditions are compared with the living conditions of the citizens in the Corona period, and by adapting to the global preparedness situation regarding the control of the Corona virus, comprehensive mobilization of the international community, to the same extent which has been adopted in all countries of the world to fight against Corona has been proposed.

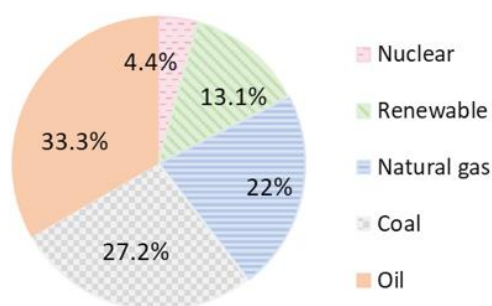
<sup>1</sup> There are currently several expert debates as to whether the harmful environmental effects of greenhouse gases are related to carbon dioxide or other greenhouse compounds. Some experts believe that not all climate change is caused by carbon dioxide emissions. Methane gas is also significantly released into the atmosphere from human sources, which has 30 times more greenhouse power than carbon dioxide. Nitrogen oxide gas, also known as laughing gas, has a 300 times greater greenhouse effect than carbon dioxide. This gas enters the atmosphere mainly due to the use of nitrate chemical fertilizers and the agricultural industry is its largest producer. Some also consider the share of water vapor in the atmosphere to play a key role in greenhouse gases. Despite the technical controversy that has been expressed about the importance of the impact of each component of greenhouse gases, there is a consensus on the destructive effects of greenhouse gases on the Earth's atmosphere.

## GREENHOUSE GASES AND GLOBAL WARMING

Greenhouse gases are gases that change the composition of the Earth's atmosphere. A brief explanation is needed to understand why these gases are called greenhouse gases. Explain that living things on Earth are made up of plants and animals (including humans). Animals use oxygen gas and produce carbon dioxide in all their vital activities. Plants, unlike animals, consume carbon dioxide and produce oxygen in their vital activity. As long as the activity of these two groups of creatures is equal, the balance in the production and consumption of oxygen will be maintained and the composition of the atmosphere will remain constant. This reciprocal activity of plants and animals, which lies in the inherent creation of the earth, is called the power of the earth's self-refining. In other words, forests, called the lungs of the earth, compensate for the damage caused by animal activities and return the carbon dioxide produced to oxygen [4]. Of course, this is as long as the carbon dioxide produced is in the scale and extent of the respiration capacity of the earth's forests and vegetation. When animal and human activity exceeds the respiration capacity of forests, nature will not be able to reproduce the oxygen consumption. In such a situation, oxygen consumption will exceed its production, and the continuation of this situation will lead to a change in the composition of the atmosphere. In 2017, the accumulation of carbon dioxide in the atmosphere reached about 403 parts per million, while in 2015 this index was about 400 ppm. According to scientists, the Earth has never experienced such a rate of increase in carbon dioxide production, so that its growth rate has been 100 times faster than during the last ice age<sup>2</sup> [5].

The last time carbon dioxide accumulated in the Earth's atmosphere was 400 ppm, more than 3 million years ago. According to the report, the temperature in this period was 2-3 degrees higher than now, the ice of Greenland and part of Antarctica melted, and eventually caused the sea level to rise by 10-20 meters compared to the present time.

<sup>2</sup> The International Panel on Climate Change (IPCC) estimates that by the end of this century, some 730 billion tons of carbon dioxide must be removed from the atmosphere. This is equal to the amount of carbon dioxide emitted by the United States, Britain, Germany and China since the Industrial Revolution. The absorption of carbon from the atmosphere by tropical forests peaked in the 1990s, when about 46 billion tons (equivalent to about 17% of man-made carbon dioxide emissions) were released from the air. In the last decade, this amount has reached about 25 billion tons or only 6% of global emissions. According to a study by nearly a hundred scientific institutes, over the past three decades, the amount of carbon absorbed by the world's pristine tropical forests has declined. They now account for 66% more carbon uptake than in the 1990s due to the effects of higher temperatures, drought and deforestation. The downward trend is likely to continue due to the growing threat of forests from climate change and poor exploitation.



**Figure 2.** The share of each energy source in the total energy production in the world

The Earth's atmosphere is inherently composed mainly of 21% oxygen and 79% nitrogen. The refractive index of the compound in the presence of sunlight is equal to 1.0002926 [6, 7]. When the refractive index of sunlight in contact with the Earth's atmosphere is at its normal value, a certain part of the radiated light energy is absorbed by the oceans and the photosynthetic reaction which takes place in plant cells via chlorophyll pigments of the leaves and the rest is reflected and released from the Earth's atmosphere [8]. If the composition of the atmosphere has changed due to the accumulation of emitted gases, the refractive index of light in the atmosphere will be slightly reduced, and the reflection and emission of radiation from the atmosphere will be disrupted. In other words, changing the refractive index of light causes the sun's rays to enter the Earth's atmosphere while the excess amount of its consumption does not leave the atmosphere. This phenomenon is called the greenhouse phenomenon because of its similarity to what happens in greenhouses, and its final effect is global warming [9].

Global warming occurs because the sun's rays enter the Earth's atmosphere and after meeting the energy needs of the creatures on Earth, the excess amount is not released and is trapped in the Earth's atmosphere. Trapping excess energy in the atmosphere inevitably causes it to be absorbed into the oceans. Oceans are called natural reservoirs and regulate the earth's temperature due to their significant heat capacity and the ability to absorb and dissipate energy on a large scale [10]. In other words, the oceans are able to balance the

earth's temperature fluctuations during the day as well as the seasons. When necessary, they absorb some heat energy and dissipate it when needed, thus balancing the earth's temperature fluctuations. But if thermal energy is constantly entering the atmosphere and leaving it with difficulty, it will cause a gradual rise in ocean temperature, a phenomenon known as global warming [11].

What are the problems that global warming brings? These problems are so many that it is beyond the scope of boredom, but some important and major cases are briefly mentioned here. The Earth is cold and icy in the Arctic and Antarctic, and warm and temperate at the equator, due to its inherent coordinates and the position and motion of the Sun. For millions of years, the cold of the poles has led to the formation of huge icebergs in the Arctic Ocean. Thus, a temperature gradient has been established between the poles and the equator, which is the source of many climatic changes on Earth. Due to the occurrence of this temperature gradient, a stream of hot water rotates from the equator to the north in the Atlantic Ocean and then in the direction of the Gulf of Mexico called the Gulf Stream, which in turn follows to the northwest of Europe causing hot and humid winds on this continent<sup>1</sup>. It rains and rains clouds over Europe. These clouds are the main cause of rainfall and vegetation on the continent [12].

As the earth warms, the polar ice caps melt and icebergs move through the ocean during their melting process. Ocean water levels rise, the temperature gradient between the poles and the equator disappears, the Gulf Stream is cut off, and precipitation and humidity from the Atlantic to the Green Continent are disrupted. As this situation continues, the green continent dries up. Atmospheric changes due to the melting of polar ice caps have caused severe storms and devastating storms along the ocean coast. By changing the pattern of winds, the natural flow of precipitation is changed and climate change occurs in different parts of the earth [13, 14]. In this regard, sometimes in winter, summer temperatures are experienced, and in summer, it may be cold and snowy. The natural cycle of the seasons and the seasonal cycle is disrupted. Plants become disordered and the plant pest cycle undergoes growth and evolution. With strong winds, forest fires occur on a large scale and the

<sup>1</sup> The Gulf Stream is about 100 kilometers wide and 800 to 1,200 meters deep, with a water velocity of 2.5 meters per second and a heat transfer rate of 1.4 petawatts ( $10^{15}$  watts), which is equivalent to 100 times of the energy consumption of the world. The heat of the Gulf Stream hot water is equal to the heat of burning two million tons of coal. The intensity and heat of this current is such that it can heat the air of all northern European countries. If the temperature of this river is reduced by 15 degrees, all northern European countries, especially the United Kingdom, will probably be frozen.

The Gulf Stream has a certain color. The color of the blue Gulf Stream is light blue. Therefore, the flow is well visible among the green and gray waters around it. The Gulf Stream flows from the surface

waters near the equator in the Atlantic Ocean, and this "stream" flows westward. It is 12,000 miles long and about three years long. To prove this claim, scientists placed a number of bottles containing letters in different languages in the Gulf Stream and these bottles reached the starting point after three years. As the Gulf Stream begins in a very hot region of the world, it is itself a hot water stream, and the existence of such a large stream of hot water has caused dramatic changes in the climate of many parts of the world. Due to the Gulf Stream, London and Paris also have mild winters, otherwise these two cities, because they are located in the north, must have very long and cold winters like the southern Labrador in northeastern Canada.

rest of the forests are more or less plagued by pests. Hurricanes bring torrential rains and cause devastating floods in different parts of the world. Some animal species become extinct and many animal pests reproduce exponentially [15–17]. In many areas, lakes are drying up and access to fresh water is declining [18]. With climate change and adverse atmospheric changes, following the growth of plant and animal pests, pathogenic viruses and microbes grow and multiply, and human life on land, and aquatic life in oceans encounter with serious risks [19, 20].

### **THE IMMINENT DESTRUCTION OF LIFE ON EARTH**

It was around 2010 that I took an article from one of the world's leading journals, quoting a number of world-renowned scientists, to teach part of an environmental chemical engineering course. This article stated that life on Earth was very short and predicted that life on Earth would be extinct in the not-too-distant future. Excerpts from the article caused a stir in the classroom and disrupted classroom management. The students joked that now that we have a short period of life left, we should drop out of school and take up non-essential necessities. The convincing statistics that the researchers cited in their article shocked the students, but it was clear that they still did not understand the truth, despite accepting the allegations; a fact that in many other cases also affects us humans. We understand and accept things, we know and accept them, but we do not understand and we do not believe. Everyone agrees that smoking is carcinogenic, but they do not believe and smoke. Everyone knows that life on earth is on the verge of extinction, but they do not believe it, and they go about their daily business without taking positive deterrent action; the same disbelief that political leaders and rulers of the world suffer from. They are also well aware of this bitter reality, but their action is even less than small and insignificant.

For the sake of brevity and to avoid elaboration, in this article, the extensive expression of signs and symptoms cited by researchers that are taking place in the path of destruction of life is avoided and only some major and obvious events are reviewed.

#### **Polar melting**

According to international organizations, the Earth's temperature has risen by an average of 1.1 °C since 1800, and 2001 has been the warmest year in Earth history. Due to the melting of polar ice during the years 1801-1900, the surface of the oceans rose only 6 cm, while during the years 1900-2000, this amount was equivalent to 19 cm [21, 22]. It is also predicted that if the melting of the ice continues with the same trend, the increase in the height of the oceans in 2100 will reach 2.5 meters. Human industrial activity during the second half of the twentieth century has been reported to be the cause of these

unbelievable developments. Currently, large areas of Greenland that were previously covered in ice have been released from under the ice, and a fertile land equivalent to the area of Iran has been created [23]. The world superpowers are rapidly making the necessary preparations to occupy these lands, and the United Nations has established a new administration to manage these lands.

#### **Climate change and seasonal disturbance**

The natural life cycle of organisms on Earth is linked to seasonal rotation and the rotation of the Earth determines the four seasons of spring, summer, autumn and winter with their own coordinates in different parts of the earth. Disruptions in the Earth's atmosphere have disrupted this rotation and we are witnessing numerous seasonal anomalies in most parts of the world. Snow and rain in areas where it has not rained for years, unprecedented heat in winter in Moscow [24], snow and blizzard in summer in Europe [25], several warm and temperate winters in Canada [26], and seasonal climate change in many regions, including our country, Iran, are examples of climate change.

#### **Growth and development of microbial and animal diseases**

The protective layer of ozone, which protects the earth from the harmful rays of the sun (ultraviolet rays), is damaged by some industrial and agricultural activities of humans, and as a result, the environment and all organisms from humans and animals to plants are exposed to this radiation. Tree disease in the Zagros forests, locust infestation in Africa and locust infestation in Asia, declining dissolved oxygen in seawater due to warming and death of aquatic plant and animal species, and loss of genetic resources in the seas and oceans are examples of this anomaly [27, 28].

#### **Untimely rains and the occurrence of floods**

Climate change has disrupted rainfall patterns in most continents of the world and has led to heavy rainfall. Extensive floods in China, India, Bangladesh, South America, Britain, etc. are examples of this bitter reality [29]. March 2019 flood in Iran, which had the equivalent of one year of rain in the region in a few hours, is considered in this regard.

#### **Severe storms**

Hurricane Matthew is one of the most powerful and deadly hurricanes in history recorded on September 22, 2016. The storm killed 1,027 people and caused \$ 5 billion in financial damage [30].

Hurricane Sandy started in Cuba in 2012 and affected 24 US states. In this storm, floods hit the streets, subway lines and tunnels of cities and in addition to financial losses, about 233 people were killed [31].

Hurricane Katrina began in the Bahamas in 2005 and reached the Gulf of Mexico. Hurricane Katrina submerged more than 90 percent of the Mississippi River coastal cities, and many people drowned. New Orleans suffered the most damage and flooded the state capital for several months [32].

Hurricane Jane struck Florida in 2004, causing flooding in many parts of the country. The storm occurred 3 km from the site of the France and Evan storms that occurred a few weeks ago. The death toll from the storm was estimated at 3,035 people and the financial damage was estimated at \$ 6.8 billion [33].

Hurricane Charlie occurred in Cuba and the US state of Florida in 2004. In this storm, trees were uprooted, cars were destroyed by trees, and electric poles fell [34].

Hurricane Mitch formed in 1998 in the Caribbean at a speed of 290 kilometers per hour. The storm killed 11,000 people, left 11,000 missing and left 2.7 million homeless. The storm has reported a financial loss of \$ 6 billion [35].

#### **Widespread forest fires**

Two years ago, there was a massive California wildfire (November 2018) that lasted about a year, and the entire US military and technology could not contain the fire, and millions of acres of forest were destroyed [36].

Last year (Aug 2019) there was a huge fire in the Amazon rainforest in Brazil, which the Brazilian government sought the help of all world powers to contain it and save the lungs of the earth [37, 38]. The extent of the fire as of January 6, 2019 is estimated at 8.4 million hectares.

Widespread wildfires in Australia this year (June 2019-2020); More than five million hectares of the continent's forests were burned during the fire, which the Australian government described as uncontrollable [39]. It is estimated that approximately half a billion animals (480 million) have died in the country's forests, which are home to 244 species of animals.

#### **POSITIVE ACTIONS BY GOVERNMENTS AND THE UNITED NATIONS IN CURBING GLOBAL WARMING**

The growing pollution and degradation of the environment and the emergence of successive environmental crises have prompted governments to work hard for about five decades to find a solution. Thus far, about 280 international and regional treaties and agreements in the field of environmental protection and related issues have been concluded, of which about 70 conventions and protocols have a global aspect and the rest have a regional aspect. In the meantime, Iran has also acceded to a number of conventions and protocols, and the Environmental Protection Agency, as a national

authority, is responsible for implementing most of them [40].

#### **Stockholm Convention (1972)**

The global determination to protect the environment became tangible with the convening of the first United Nations World Conference on Man and the Environment, known as the Stockholm Convention, in 1972 in Sweden, so that the human right to a healthy environment is on a par with Human rights were recognized [41].

#### **Vienna Convention for the Protection of the Ozone Layer (1985)**

In 1985, at the invitation of the United Nations, representatives of 21 countries and member states of the European Union met in Vienna, Austria, to discuss the provisions of the Convention. What was ratified was called the Vienna Convention [42].

#### **Montreal Protocol (1987)**

This agreement is an independent but complementary treaty to the Vienna Convention on Ozone Depleting, which was signed in 1987 and entered into force two years later. The Montreal Protocol can be considered an example of the most successful international environmental cooperation. The member states of this protocol have established a series of rules that are constantly amended and revised in the light of the latest scientific and technical information, and 96 articles of it have been approved so far [43].

#### **Establishment of the UN General Assembly Negotiating Committee (1990)**

In the 1980s, scientific evidence showed that the emission of greenhouse gases from human activities posed a threat to the world's climate, and thus public opinion felt the need to hold periodic international conferences and treaties to address this issue. Governments held a series of international conferences to reflect public opinion and called for an international agreement to address the issue. In 1990, the UN General Assembly formed the Intergovernmental Negotiating Committee to draft the "Climate Change Convention" [44].

#### **Climate Change Convention (1992)**

The Convention on Climate Change, formally known as the United Nations Structural Convention on Climate Change, is one of the key topics in the 1992 Rio Earth Summit on Environment and Development. The convention was signed in 1992 in New York. Under the treaty, member states have common but distinct responsibilities. The priority in this convention as the most basic requirement for developed countries was to limit their emissions in the first two decades of the 2000s to the level of 1990 and to stabilize at the same level [45].

### Kyoto Protocol to the Climate Change Convention (1997)

With the adoption of the United Nations Framework Convention on Climate Change in 1992, governments saw it as a launching pad for more fundamental action in the future. In response to changes resulting from scientific knowledge and political will, the Convention allows for the acceptance of additional commitments through review, discussion and exchange. The first review of the adequacy of the commitments of developed countries, which was emphasized at the first session of the Conference of Members, took place in 1995 in Berlin. The delegations concluded that the commitments of the developed countries to reduce their GHG emissions in 2000 to the level of 1990, with the long-term aim of the Convention to prevent the interference of man-made wastes with the climate system, are inconsistent.

Therefore, the ministers and executive officials of the countries, while accepting the Berlin Agreement and the beginning of a new round of negotiations to strengthen the commitments of the developed countries, accepted the new commitments. The Special Agreement Group set up under the Berlin Agreement to draft the protocol sent the protocol to the third meeting of the members after eight sessions. The conference, hosted by Japan in Kyoto in December 1997, was attended by about 10,000 people. One of the positive outcomes of the conference was the adoption of a new protocol under which industrialized nations pledged to reduce their greenhouse gas emissions by 5% below the 1990 emissions from 2008 to 2012. This mandatory and legal obligation, if implemented, will gradually reverse the rising greenhouse gas emission curve of the industrialized world over the past 150 years.

The Kyoto Protocol was prepared on March 16, 1998 for the signatures of the members. The protocol shall enter into force 90 days after the ratification of at least 55 Members of the Convention, provided that the greenhouse gas emissions of these 55 Members are greater than 55% of the total greenhouse gases emitted in 1990 by industrialized countries. It was also agreed that the members of the Convention on Climate Change will continue to fulfill their obligations under the Convention and prepare for the implementation of the Protocol in the future [46].

### South Africa Durban Summit (2012)

Although participants in the World Climate Change Conference in Durban, South Africa, failed to meet a new binding commitment due to opposition from some countries (mainly China and the United States), they tightened the standards on emissions. The conference, which lasted nearly two weeks, was attended by delegations from 194 countries. The conference participants extended the greenhouse gas emission agreement until 2017, known as the Kyoto Protocol, and agreed to pursue negotiations on a new draft. The

summary of the topics discussed at this summit is the efforts of developed countries to extend the binding commitments to reduce greenhouse gas emissions to other countries, including developing countries, which were expected after 2017 for a period of three years, until 2020, to be formulated and approved in the form of new commitments [47].

### Paris Climate Agreement (2015)

The Paris Agreement is part of the United Nations Framework Convention on Climate Change on Greenhouse Gas Emissions, Compatibility and Finance, which begins in 2020. The text of the agreement was negotiated by the representatives of 195 countries at the 2015 UN Climate Change Conference in Paris and was adopted by consensus on December 12, 2015; announced on April 22, 2016 (Earth Day) at a ceremony in New York for members to sign. As of 2017, 195 members of the treaty have signed and 147 countries have ratified it. The aim of the Paris Agreement was to try to increase the Earth's temperature by a maximum of 1.5 degrees Celsius by the end of this century, instead of two degrees Celsius, by a strict quota on greenhouse gas emissions in member countries [48]. Table 1 shows the quotas of a number of countries by population.

**TABLE 1.** Capacity agreed by the Paris Agreement by a number of countries to produce greenhouse gases; (sorting by population)-(Date of signing April 22, 2016 and date of implementation of the agreement November 4, 2016)

Country	Population in 2017 (Million)	Approved amount of greenhouse gas emissions (%)	The ratio of population to world population (%)
China	1386	20.09	18.35
India	1339	4.10	17.50
USA	325.7	17.89	4.22
Brazil	209.3	2.48	2.71
Russia	144.5	7.53	1.88
Japan	126.8	3.79	1.62
Germany	82.5	2.56	1.05
Iran	81.2	1.30	1.05
Turkey	79.8	1.24	1.05
France	66.8	1.34	0.86
UK	65.8	1.55	0.85
South Africa	56.7	1.46	0.74
South Korea	51.5	1.85	0.66
Canada	37.6	1.95	0.48
Saudi Arabia	32.9	0.80	0.43

Global carbon dioxide emissions have increased from 2 billion tons in 1900 to more than 37 billion tons in 2017. According to the World Institute of Natural Resources (2015), China is the top producer and Iran is considered one of the top ten countries in greenhouse gas production with 1.65% of the world's total greenhouse gas emissions and an annual production of 715 million tons of carbon dioxide [49]. Under the Paris Agreement, which has not yet been finally approved by the Iranian parliament, Islamic Republic of Iran has pledged to reduce its greenhouse gas emissions by about 12 percent by 2030 if it receives global funding, and otherwise by only 4 percent.

On June 2, 2017, then-US President Donald Trump announced that he would withdraw from the agreement. While it was signed by former US President Barack Obama, he said it was against US interests. Trump added that withdrawing from the agreement would boost the coal and oil industries. "The United States is withdrawing from the Paris Agreement, but will continue to negotiate a better deal," he said at the White House. On Friday, August 4, 2017, the United States officially announced its decision to withdraw from the Paris Climate Agreement in a letter to the United Nations. The US State Department letter states that Washington will be present in the negotiations on this global treaty until the final withdrawal from the treaty in 2019.

That said, despite the ratification of numerous protocols, conventions and international treaties over the past five decades, experts and UN officials have acknowledged that no substantial progress has been made in curbing greenhouse gas emissions. One of the reasons for this failure is the backwardness of the two economic powers of the world, namely the United States and China, to these treaties. The two industrial powers, each of which, despite having a share of about 20% of greenhouse gas emissions, one with overt reversal and the other with false acceptance and covert reversal, still play a major role in greenhouse gas emissions.

Another major reason for the failures is the lack of real belief and adherence of other member states to the mentioned treaties, which instead of adhering to the approved ceilings, try to circumvent the approvals. Some hypocritically buy and sell emissions points within approved frameworks. In other words, countries that produce more than the approved ceiling for greenhouse gases buy the concessions of other countries that produce less than the approved ceiling. European countries, in a different action that has a scientific color and smell, while avoiding the reduction of greenhouse gas emissions, try to imprison it [50, 51]. This activity, known as carbon sequestration, involves trying to trap some of their greenhouse gases instead of emitting them into the atmosphere in underground coal mines or deep-sea cavities called aquifers. This is the subject of the largest number of scientific and research projects in Europe in

the last two decades, despite the high costs and many administrative problems.

## HOW NATIONS INTERACT TO REDUCE GREENHOUSE GAS EMISSIONS?

To prevent the extinction of life on earth, greenhouse gas emissions must be reduced immediately and promptly. In other words, oxygen consumption must be balanced with the oxygen production capacity of forests. As long as the consumption of oxygen is several times its production in the Earth's atmosphere, the composition of gases in the Earth's atmosphere cannot be returned to normal. Consumption of fossil fuels (hydrocarbons) must be significantly reduced to reduce greenhouse gas emissions. To reduce the consumption of fossil fuels, there is no choice but to reduce industrial activity, at least until renewable fuels can be replaced.

But what if we want to reduce industrial activity to one-half or one-third? Reducing industrial activities means reducing transportation, reducing aircraft flights, reducing ship traffic, reducing urban and intercity travel, reducing production, reducing the number of factories, reducing mining, reducing the consumption of products by citizens, reducing production and consumption of crude oil. A reduction of not 5 and 10%, but a reduction of about 50 or 70% in the total daily human and industrial activities in the whole advanced industrial world.

But what is the perception of such a situation? What will be the daily state and performance of the citizens in that new situation? None of us can imagine that situation even in the mind. Consider large cities like Tehran where urban traffic reaches one-half and one-third. Reduce the number of private cars. Reduce the flight of passenger planes and urban and intercity bus fleets to less than half. Many people stay home and do most of their work through the internet and virtual network. Many school and university courses are taught at home. Long distance travel should be significantly reduced and only in cases of necessity, etc. Can such a thing be achieved in the real world? Will this model be accepted by the citizens if it is proposed as the only model of saving the earth?

The author's idea of the living conditions of citizens in favorable environmental conditions is similar to the situation created by the Corona virus in cities and countries. For the past two decades, since 2000, the present author has been asking students to visualize such a situation and to evaluate the possibility of applying such a pattern of daily activities. He even consulted with several film directors to make a film, if possible, depicting the situation in which the energy consumption of the citizens has been reduced by half in the city and the countryside; a film similar to Hollywood fantasy films in which it imagines another world with its own completely different specific circumstances.



At the same time with the second or third day of the Iranian new year (March 2020), it was announced on Iranian national television that the daily consumption of gasoline in the country has decreased from 90 to 70 million liters per day. The author initially thought that a reduction of 70 million liters had been made and that consumption had reached 20 million liters. Further investigation revealed that the reduction in gasoline consumption was only 20 million liters, and despite the home quarantine of the vast majority of citizens, gasoline consumption is still about 70 million liters per day. Now imagine what would happen if we wanted to reduce fuel consumption by half or less. In a situation where there is a threat of disease and military and law enforcement forces are used all over the world to control and forcibly reduce activities, fuel consumption has been reduced by only about 20%<sup>1</sup>. At the same time, it has been announced that water consumption in Tehran has reached an unprecedented 3.5 million cubic meters per day, and in exchange for a reduction in fuel consumption, a new record of water consumption has been recorded in this metropolis. This is while reducing energy consumption means all the energy needed, including utilities. From these observations, we can imagine what many problems the reduction of energy consumption in the world is facing. Problems that make favorable environmental conditions impossible and unattainable even as a dream.

According to the author, it would be very useful if researchers and elites model the situation and draw the necessary conditions and mechanisms to lead citizens to the desired environmental conditions. We engineers have been taught that we need to turn a threat into an opportunity in any situation. It is true that the special conditions of the Corona virus are prevailing in the country now, and the threat of the disease has occupied the minds of the people and the officials. But what good it would be if environmental researchers made the most of these conditions and used part of the capacity of radio and television and mass media to promote the need to address environmental issues and help sustain life on Earth?

## ANALYSIS OF THE CURRENT SITUATION

It turned out that neither governments nor nations have the determination and capacity to deal with the environmental crisis in the short term. Therefore, reason and logic dictate that one should look for medium and long-term solutions, although the sirens sound and the signs all indicate the need for immediate action.

<sup>1</sup> On the 13th of Farvardin (April 1, 2020), when house quarantine reached its peak, the Iranian Minister of Interior announced that fortunately, gasoline consumption has been reduced by 55%.

<sup>2</sup> In 2010, the World Resources Institute (WRI) presented the Climate Assessment Indicators (CAIT) survey of the world's share of

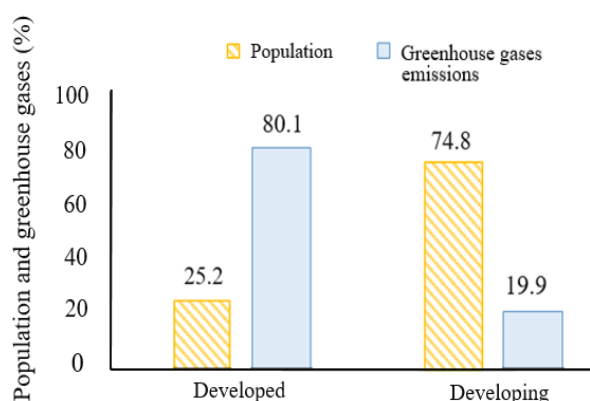
However, it is not useless to pay attention to the following:

First of all, it must be admitted that industrial development, contrary to what has been propagated and pretended, has not been sustainable development. If industrial development was a comprehensive development, it would not have led to such an environmental catastrophe on such a large scale. What mankind has done during the period of development, even by skilled scientists and craftsmen, is an example of a careless person sitting on a branch and cutting it with an ax.

The division of the world into developed, developing, and less developed countries, and the boasting of the developed into the underdeveloped, is not a correct scientific division. Environmentally, the so-called developed countries are guilty, and the underdeveloped countries are free from crime. The destruction inflicted on humanity by so-called industrialized nations has never occurred in less developed countries<sup>2</sup>. Figure 3 shows the major share of so-called industrialized countries, despite the fact that they also use nuclear energy [52].

The values that govern the industrialized countries, namely consumption and the originality of consumption, which have been propagated and laid down to strengthen the economic foundations of these countries, are a serious threat to human life and must be eliminated in any way from the human societies. As long as airplanes, luxury cars, ceremonial equipment, and Hollywood consumer culture prevail, and human personality is measured by these criteria, creating an opportunity for environmental culture to emerge seems impossible.

The issue of land and ecology protection should be demanded and pursued as an essential demand by elites, scientists, researchers, theologians and intellectuals from



**Figure 3.** Chart of share of greenhouse gas emissions by developed and developing countries

greenhouse gas emissions. The results of these studies showed that developed countries, although they control only 20% of the world's population, produce 75% of man-made greenhouse gases. Developing countries, meanwhile, emit only 25 percent of the world's gas, despite having 80 percent of the world's population.



executive and governmental officials in all countries of the world. It is not unreasonable to recommend that the level of commitment and service of party, political and government officials around the world be measured on the basis of commitment and continuity in activities based on environmental slogans.

In Islamic countries, and especially in Islamic Republic of Iran, which claim religiosity, the environmental requirements recommended in religion should be further highlighted and promoted and considered as criteria for distinguishing between faith and unbelief. Obviously, a religious and morally oriented country is expected to be a model for other countries and nations in all environmental matters and to be adorned with good environmental morality.

Intellectuals, elites and educated people should play a greater role in motivating the masses towards environmental models through the formation of non-governmental organizations and environmental movements, and prepare public opinion for environmental activities<sup>1</sup>. Green language can be used as a single language, the discourse of the union of intellectuals and elites of different nationalities to strengthen the pro-environmental front against the front of profit-based cartels and anti-humanitarian companies.

Protecting fossil resources and making the best use of these God-given resources and protecting the rights of future generations are among our national and religious duties. Also, directing the efforts of scientists and researchers to achieve the processes of optimal use of fossil resources in the production of advanced materials with high added value, instead of burning them, is one of the items that should be supported, sanctified and honored.

Maximum use of clean and renewable energies such as solar, wind, geothermal and hydropower energies, and maximum savings in fossil fuel consumption, as well as the use of engineering equipment to prevent energy waste and double attention to the recycling process would be the best roadmap towards a green world.

Carrying out more expert studies in the implementation of major technical and engineering projects in the country, such as the passage of highways through forests, the application of desertification methods such as mulching, seawater desalination,

construction of new ports, relocation of waterways and rivers at the national level, the construction of dams, the fight against dust, etc., and the attachment of an environmental annex to all large projects in the country seem to be necessary. In this regard, it will be very useful if, like in many countries, a compulsory undergraduate environmental course is included for all students of technical and engineering fields so that the officials of tomorrow's industrial and civil development become more familiar with environmental requirements and standards.

Adapting from models such as the social model of general mobilization of countries against the Corona virus and aligning national determination in sacrifice for sacred purposes such as environmental goals, is one of the valuable teachings of the Corona epidemic period that can be of great benefit to us. Utilizing the artistic, religious, national, indigenous, and climatic capacities of countries to drive the global economy into a green economy is another lesson of the National Corona Exercise that deserves to be considered by experts.

## CONCLUSIONS

The global warming crisis is a transnational and trans-regional crisis on a global scale. This means that the performance of each country will determine the fate of the other countries. For example, if China violates the conventions on greenhouse gas emissions, it will cause drought in Europe, or if the United States is not successful in this regard, Australia's forests will be on fire. Now that the issue is global, the solution requires global cooperation, and economic and arms races, among others, will only help to exacerbate the crisis and waste opportunities.

More than industrially advanced humans need to find a way to limit greenhouse gas emissions, they need the determination to implement existing solutions. A senior health official in connection with the Corona crisis said that until the death penalty was not taken seriously by the Corona, not everyone would follow the instructions of the Corona Anti-Corruption Headquarters; an event that is exactly like the reaction of governments and experts around the world to the global warming crisis. In fact, the

But humanity is still struggling with a nuclear war on the one hand and the catastrophic destruction of the environment on the other, which will destroy the human being and generation forever. Therefore, the present moment is one of the most important moments in human history. These moments are not only due to the fight against the Corona virus, but also to the awareness of the shortcomings of world systems and the failure of their economic system, which must change to improve the future of humanity. Therefore, the Corona virus is a warning and alarm to prevent future catastrophes. In other words, ignoring this warning and not investigating and searching for the roots of such pervasive crises will undoubtedly lead to a worse future for us.

<sup>1</sup> "Noam Chomsky, a 91-year-old linguist and political analyst from the US state of Arizona, who is in voluntary quarantine due to the Corona virus, died on Saturday, April 4, 2020 in the midst of Corona virus disease on television. "Democracy in the European Movement 2025" discussed the issue of the Corona. Regarding the need to learn from Corona to combat global warming, he said:

The health crisis that the Corona virus has created for human beings today is very dangerous and serious and may have even worse consequences in the future. But this crisis is temporary and will eventually be resolved; While we are faced with too much more dangerous and serious permanent crises that are destroying human existence at once. These two crises are nuclear war and global warming.

daily problems and ongoing economic challenges posed by the consumption of human societies have created a fundamental obstacle to thinking and finding a way to curb greenhouse gas emissions.

Collaborating the efforts of scientists, elites, intellectuals, artists, and leaders of nations and peoples, and using all the scientific, cultural, artistic, national, religious, ethnic, and indigenous capacities of nations is the only way to overcome obstacles, and build determination. The world is considered to prevent the extinction of life on earth. It is up to the above-mentioned strata to take a step in this direction, firstly, by educating environmental requirements at all levels of education, and secondly, by establishing non-governmental organizations, and by taking positive and urgent measures, to commit to the human ecosystem.

Finally, there is no point in warning that if we do not listen to the cries of the earth and the nature around us and do not act quickly to heal, we will have to wait for events that are far more painful, destructive, pervasive, and more incurable than the Corona virus.

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### Persian Abstract

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### چکیده

این مقاله همزمان با اوج‌گیری ویروس کرونا در کشور و طی قرنطینه خانگی، مصادف با چهلمین روز ورود ویروس کرونا به کشور در فروردین ۱۳۹۹، به رشته تحریر درآمده است. غرض از نگارش این مختصر، ابراز همدردی با زمین و پاسخی به ناله‌های فراموش شده او است. فعالیت هرچند دیر هنگام، و در عین حال خرد و ناچیز، به امید التیام وجدان زخم خورده عالمان بی‌عملی چون نگارنده که امیدوارند اقدام مثبتی در جهت حفظ و صیانت از زمین، زیست‌بوم بشری، به عمل آورند. تاکید و هدف این نوشته، الگوگیری از عزم و بسیج ملی در مبارزه با کرونا برای هدف والاتری همچون نجات زمین و حیات بشری از فاجعه نابودی است. در این راستا، آموزش الزامات زیست‌محیطی در مقاطع تحصیلی، توسعه گفتمان نخبگانی در چارچوب تشکیل سازمان‌های مردم‌نهاد، و استفاده از ظرفیت‌های علمی، فرهنگی و بومی به عنوان راه‌حل پیشنهاد شده‌اند.