

An evaluation and understanding the greenhouse gas fluxes and management in Iraq

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HIGH LIGHTS

- The most emitted gas is carbon dioxide gas from various sources and activities
- High temperatures, lack of rain and sandstorms are among the signs of climate change in Iraq and global warming
- The most affected region is Basra due to the presence of the oil industry in its largest state
- The weakness of legal institutions and the failure to initiate the imposition of sanctions and make it difficult to manage projects environmentally
- The first step for successful environmental management to solve the problem of greenhouse gases is the enactment of laws that are true to the environment in various fields
- Studies dealt with air pollutants only with different differences Sources Without different sources of greenhouse gas emission

ABSTRACT

In support of the Paris Agreement and the world's trend towards solving the problem of global warming and climate change, which has increased since the last century due to the high concentration of greenhouse gases, studies have been carried out to solve this issue in the world, where the problems are common in most of the world, including developing countries with huge populations and industrialized countries, especially in the Middle East and North America, with common sources and some emissions in different proportions.

In Iraq, being a country that suffers from a hot dry climate and a lack of rainfall due to the geography of the region and its climatic nature, the impact of global warming has been clearly observed, especially in recent years due to wars, increasing sources of pollution and weak infrastructure for pollutant management and treatment. In the current study, greenhouse gases, their sources and effects in general in Iraq have been studied and evaluated as emissions to give environmental management plans to solve the problem and give the largest role to government institutions and the law and its role in solving these problems. Where it was found that the highest emission is for carbon dioxide gas by 4.27 tons per year, and previous studies were only based on emissions from the oil industry and the production of electric power, which are the largest source of greenhouse gases because it is a source of energy. Fossil fuels, which is the oil industry and used in energy production. The country lacks a structure of renewable energies, which was the reason for the rise in pollutants in general, air pollutants and greenhouse gases in particular, as their rise contributed to the rise in the temperature of Iraq by 0.35 degrees Celsius annually and the decrease in the average rainfall in southern Iraq by 0.88 mm annually and the west by 5.8 mm in addition to the increase in desertification and the lack of vegetative cover by 87% and environmental plans were proposed represented by the role of the government and the law in imposing penalties on the defaulters who are the owners of inefficient factories to reduce emissions in the short term and then city planning in a way that reduces emissions in the long term, but no study has been conducted on the sources of emissions except the oil industry and electricity productivity.

Keywords: Fossil fuels, Emissions, Greenhouse gases, Climate changes

1. INTRODUCTION

Since the last century, specifically after the industrial revolution, a very high rise in the concentrations of air pollutants, including greenhouse gases of all kinds, has been seen, where the largest source of these gases is fuel of various kinds (1).

More precisely, it depends primarily on the use of fossil fuels in various industrial, commercial, construction and transportation activities (2,3) as well as emissions from agricultural and horticultural operations (4). Air pollution and greenhouse gas emissions have increased accurately from two sources, fossil fuels, as well as construction and urban development(5), but the most important question is what are greenhouse gases and what is their role in the climate change that has occurred in recent years, and is there a solution to this problem?

2.Greenhouse gases emissions

Greenhouse gases are a group of gases such as carbon dioxide, methane, ozone, hydrogen sulfide, nitrous oxide and water vapor in first place, followed by industrial gases such as chlorofluorocarbons (6),Previously are the various activities, but the first source is fossil fuels of all kinds, and due to the dependence of the whole world on fossil fuels for energy production, as well as the high percentage of factories and the development of cities and the increase in population numbers, which requires an increase in energy resources, all of this led to a clear rise in the concentrations of these gases from the seventies of the last century to the present day,(7).

The first gas is water vapor gas, and the most in the atmosphere, i.e. by 70%, but water vapor molecules due to their chemical properties, they merge and are affected by climate change in the world, i.e. their effect is the least effect among the rest of the gases, but the most gas that plays a role is carbon dioxide gas 36% (8), which is found in all human and natural activities, carbon dioxide gas is the first cause of global warming and climate variability, where the concentrations of this gas have increased many times since the seventies in The last century(9), followed by methane gas, which is released from activities used for fossil fuels, especially natural gas, and then gases, sulfur oxides and nitrogen(9 ,3) . All of what was mentioned is a simple summary of greenhouse gases, but this topic was emphasized and became a global topic as a result of the climate coup, global warming, lack of rain, drought and the deterioration of plant productivity that occurred and is still happening in the world(10), which made the Paris Agreement an important agreement to pose this problem and address it in several ways, as this agreement deals with the subject of Greenhouse gases in particular and air pollutants in general(11)

Since that time, found many studies that have been studied and researched about the concentrations of these gases and their basic sources and their effects on the world in a more beautiful way .

2.1 Sources

1. Fossil fuel

The first source of greenhouse gases is fossil fuels, but the classification is based, on activities, the first is the activity of energy production(12),where approximately 34% of greenhouse gases are released as a result of the use of fossil fuels in various fields of production of crude oil, gas, gasoil and others(13,14)followed by the industrial activity used for fossil fuels as well as the activities of extracting these fuels. Where it releases approximately 24% tons per year (15)followed by the activity of transportation from aviation to ships to boats, where it releases 21% tons of greenhouse gases. It has been seen that the largest release of these gases is in China, West Asia, followed by North America due to the increase in population as well as industrial activity in these regions and also in India because it has a very large population and depends on fossil fuels in the first place due to the weak trend to use renewable energies as alternative sources (10).

2. Construction activity

The second source is the construction and development of cities, which represent 12.1% of the total releases of greenhouse gases, where the establishment of cities does not only include the construction of buildings(15,61), as it includes the burning and destruction of forests and the use of industrial materials

such as lime in paving streets and roads (5). Burning forests played a major role in global warming and is considered one of the sources of greenhouse gases, as carbon gas is released as a result of burning in huge quantities to the atmosphere and the lack of sufficient green areas to absorb the gas, this in turn led to a rise in the source ratios (13,63).

3. Industries

The third is the industry of all kinds, where fossil fuels are either used to operate machinery and machinery or release gases from various industrial activities such as cement plant as well as dye factories, as well as the manufacture of agricultural pesticides and organic fertilizers, the production of refrigerants and the oil industry of all kinds (14).

Where the highest percentage of greenhouse gases produced after oil manufacturing processes is at 30% (10), followed by the various industry by 23%, while the metal mining industry accounts for 15% of the source of emission, followed by the chemical industry such as pharmaceuticals and others by 14%, while cement accounts for 8% of the source of emissions, as all together, it represents 200,000 tons of gases emitted per year(16)The highest percentage of industries is in East Asian countries(17)

4. Agriculture activities

Agriculture is one of the sources of greenhouse gas emissions as well as the most affected by global warming Such as the use of pesticides and fertilizers in large quantities, as well as the dairy industry, chicken farms and others, where quantities of gases are released due to the presence of waste from these activities and farms and not dealing with them properly(62), as they are disposed of in the form of burning, releasing gases to the atmosphere and releasing agricultural activities approximately 11.6% of the total greenhouse gases The largest percentage of methane gas by 40% and nitrous oxide gas by 62%(10,18).

With the increase in population density, the increase in the use of agricultural crops, and the pressure on raising livestock and poultry for the purpose of providing food to the population groups, which in turn led to an increase in the emission of greenhouse gases in both methane and nitrous oxide(5).

And because of the large number of dairy factories is also because of the development and increase in density, where most of these factories lack environmental management to treat waste and release most of their waste either into the riverbed if they are liquified, landfilled, or burned, releasing greenhouse gases(19)

As is happening in China, where most of the freshwater bodies have been converted into rice-planting fields, which in turn led to methane and nitrous oxide flows, as well as carbon dioxide at a concentration of 8.15 to 28.0 mg, as well as an increase in methane gas flow by 6.04 tg and nitrous oxide by 36.7 Gg Where 80% of methane concentrations are from agricultural land in China(20).

5. Landfills and waste water plants

The other source is solid and liquid waste of various kinds, especially heavy water, as fossil fuels are the largest source of various pollutants, including air pollutants and greenhouse gases in countries that lack environmental management and correct waste treatment according to global principles (21)

It includes waste from various human activities, as well as industrial waste and sewage, where these wastes are not disposed of through separation and dealing operations according to its type, as it is buried or burned without any global controls, causing the release of large quantities of gases as well as polluted fine grains, as for sewage.(22)

it is separated without global foundations and then it is discharged into rivers, causing water pollution, in addition to air pollution and others(60), poor countries of the world such as India or war countries, which lack To an integrated sewage network that suffers from this source more than others after the use of fuel, even if the network is integrated, but the population pressure and lack of maintenance lead to greater damage than others (23)

6. Transportation

And transport is the last source, where, as mentioned in the previous study, transport in all the world uses fossil fuels of all kinds, and the largest source is land transport of various kinds, as it releases 73% of the total greenhouse gases resulting from transport (24)

The first of which is North America and then West Asia, specifically China, as well as marine transport operations contribute by 8% and air transport by 7%(2,10,25)

In addition to the sources mentioned above, greenhouse gases are released from natural sources the oceans and the breathing processes that occur within them in the presence of living organisms are considered the largest source of carbon dioxide gas (26)

Swamps are the largest source of methane and temperate and tropical forests are the largest source of nitrous oxide. Where all these gases are seen as a result of natural processes, as mentioned earlier, nature is in a state of balance in the concentrations of greenhouse gases (27)

where one source is the release of gases and another source that uses gas for bioproduction, breathing, and plant production Which are sources and sinks of greenhouse gases (28)

2.2 Effects

The effects of greenhouse gases have put the whole world under the beam of change and climate fluctuations,

- the first of which is global warming. The effects are not limited only to the climatic aspect, as they have captured most aspects of the environment and humanity as a whole, in addition to ensuring that temperatures vary and rise significantly in countries with the highest emissions (29).
- It also played a major role in the field of rainfall, where in recent years the percentage of rain and snow decreased, and on the other hand, the rise in temperatures from 1 to 3 degrees Celsius led to Melting icebergs, which have led to rising water levels in countries and destroying coastal cities as a result of floods (3)

The rise in temperatures has been seen in countries with a huge population as a result of the presence of basic sources of gases, as well as industrialized countries, where one of the most seen or climatic fluctuations, lack of rain, short winter and autumn period, and high humidity(30)

which in turn has other effects, such as its impact on the ozone hole and its increase in size, which caused global panic because the resulting damage does not depend only on the climatic aspect, but also the increase in the incidence of diseases such as cancer (31)

animal migration and the destruction of environments(32)

Climate change as It affected the amount of rain and snow, which in turn led to a decrease in water levels How? The water bodies in some countries have been exposed to drought as a result of heat as well as as pollution (5)

which made them unusable, as some countries suffer from drought and water scarcity, and some suffer from floods, such as India, one of the first countries affected by the lack of water levels is the countries of the Middle East(6,20)

- The scarcity of water is one of the global as well as political problems, as it has generated great pressure on the many economic, international and social aspects (22)
- The weakness of environmental management may play a major role in this area, as due to the increase in the population in the world, like India, has tended to use large quantities of water without treatment and management of heavy water, where the drought resulted and in turn led to the trend of using groundwater at very high rates, as it affected along with another low levels Water and the drying up of water bodies on one side and the other side is flooding and melting skins in the North Poles destroying coastal areas and environments there (33)
- Among the other effects, which are very clear, is desertification and dust storms, high temperature and lack of rain, which led to desertification, as well as high rates of fires in forests, as happened in Australia, America and Turkey, desroying vegetation covers and environmental systems (3 ,4,34)

- These effects are considered an integrated and successive circuit, where each action has a reaction, where burning forests increases the release of quantities of gases into the atmosphere, and this in turn increases climatic fluctuations. The evacuation of soil from vegetation and forests has been exposed by to drought, including sand and dust storms, which have increased in the last millennium, as seen last year, and we will see them in the coming years. Another aspect of this impact is migration, imbalance in biodiversity and its destruction in forest areas (13,14)

As previous studies mentioned that the effects are an integrated series, the other effect, which is what has been seen in African countries, as well as currently in most of the world, is the scarcity and poverty of foodstuffs, where cereals such as wheat, barley and corn represent the first food source in the world (18,35)

where studies have indicated that the rise in temperatures to the surface of the earth reduces the amount of carbon used for plant production as a result of the high rates of respiration in plants due to heat, which led to poor plant production, as happened in China (36)

in Egypt suffers The state of scarcity in food and water, where the old methods of agriculture and the use of pesticides and fertilizers in abundance and intensive agriculture led to the weakness of soil weaving and loss of properties, which led to the weakening of production and other sandstorms and dirt leads to soil erosion and removal of vital layers (37)

3. Air pollution in Iraq

Iraq is considered one of the countries of wars and a country that lacks the foundations of infrastructure after the wars and shocks that occurred and the weakness of management in various fields (38)

the country witnessed the effects resulting from the increase in pollutants of various kinds, and this in turn led to the creation of several health, environmental, social and even economic problems (39)

The environment of Iraq is semi-arid and that the climate of Iraq is characterized by desert or semi-desert, where it is represented by high temperatures and evaporation in summer in the south and a few rains and degrees Humidity in the north in winter(40,41)

In addition, several factors helped to increase the levels of pollutants in general and air pollutants, including greenhouse gases, air pollutants are divided into two parts:

gaseous pollutants, pollutants of fine particles.

The gases represent carbon oxides, nitrogen oxides, sulfur oxides, ozone gas, fluorinated gases, volatile hydrocarbons, as well as lead, while the particles are two types with measurements of 10 micrometers and 2.5 micrometers (42)

as shown in the following table for each source pollutant type:

3.1 Air pollutants sources

pollutant	Rate	Characteristics	Sources
CO	132 ppm	Produced by combustion of fossil fuel and biomass. All by itself, CO represents more than 50% of air pollution. In urban areas, motor vehicles are the predominant source of CO.	Major sources In urban areas, motor vehicles emit up to 95% of CO. s Cigarette smoke contains CO. . ▪ Facilities burning coal, natural gas, or biomass are CO sources.
NOx	36.5ppm	NOx are oxidized in air b to acid under moist conditions or to nitrate in dry. Both are particulates and components of haze. In cities, motor vehicles generate most	Nitrogen oxides are also sourced from transport vehicles of all kinds, as well as biodegradation in the soil by bacteria that release nitrogen oxides, as well as the manufacture of fertilizers and pesticides

		NOx. Coal-burning facilities produce significant quantities to	
SOx	102.9ppm	SO ₂ is oxidized in air to sulfuric acid under moist conditions or to sulfate in dry. Both are particulates and major components of haze. Fossil-fuel burning power plants produce about two-thirds.	Sulfur is found in raw materials, i.e. crude oil, coal and gas, where it turns into sulfur oxide when burned, electrical power plants, metals such as zinc and copper, oil refining processes, cement, as well as natural sources such as plants and algae in water.
O ₃	3.74ppm	A major component of photochemical smog formed from NOx, VOCs, and oxygen in presence of sunlight and heat. Motor vehicles are major generators of NOx and VOCs.	The sources of ozone are vehicles and plants that burn coal, as well as power plants, as it is the first source of ozone causes.
Suspended particles	50*10 ³ (µg/m ³)	Tiny solid particles composed of one or several chemicals. They have many sources. Combustion is a major source of the tiniest particles. Notice that lead is emitted as a particulate and that SO ₂ and NOx can be converted to particulates. So can some organic VOCs	Fine particles are sourced from various industries, mining operations, city building, as well as erosion operations by the air, absolutely various types of pesticides and fertilizers, as well as oil extraction, refining and industry, dyes and leather industry, asphalt industry, home furniture, in addition to power plants and vehicles.
Lead pb	1.5 _95 µg/m ³	Lead is emitted as a particulate during metal mining and processing, and during fossil fuel combustion.	Lead comes from fuel used in vehicles, i.e. fossil fuels, as well as from different industries, namely the manufacture of paints, pipes and others.
PAH	6.357 PPM	Organic chemicals that evaporate easily. Some significantly contribute to smog. Motor vehicles are a major source. Hazardous air Pollutants (HAPs) Each HAP has an emission control; not an ambient air standard. HAPs are also called toxic pollutants. About 70% are also VOCs.	

Table(1)_ Air Pollutants sources in Iraq(38,41,42,45,52,66)

3.2 What are the effects of air pollutants

- they have several effects, including a common global that some air pollutants are greenhouse gases and the first effect is global warming (43)
- while the other effects include the health aspect that most pollutants cause skin and respiratory diseases, including suffocation, allergies, lung cancer, and some others (31)
- such as lead, affect the nervous system, pregnant women and the growth of fetuses, as for carbon monoxide gas, it causes complete suffocation, as well as sensitivity to the eyes, nose and throat as a result of exposure to many air pollutants such as carbon oxide and compounds. Volatile organic in addition to headache and nausea (42,44)
- The other side is the agricultural side and productivity, which is affected by greenhouse gases and acid volatile resulting from sulfur oxides and nitrogen, causing damage to plant tissues(45,46)
- as well as the increase in the ozone hole and the presence of the phenomenon of damage (47)
- Another effect is the destruction of biodiversity, as happened after the wars in Iraq. These developed and industrial residential areas have little biodiversity, while non-urban green areas have high biodiversity due to the absence of pollutants and the presence of cover. Vegetarian (38)

4. Greenhouse gases in Iraq

Greenhouse gases are an issue and a challenge for the whole world, and as previous studies mentioned, as a result of the industrial revolution, the concentrations of these gases in the atmosphere increased, causing many problems, the first of which is climate change and global warming that has happened and is still happening in the world(7).

. Iraq is a country of wars and a country that has seen a lot of political and administrative ambiguities, which weakened the performance and maintenance of infrastructure and made it have no impact (48)

The other side is the aspect of the industrial situation in the country, the enactment of laws, and the status of most sources of pollution that have no cure (38).

Many studies and research in recent years have directed towards greenhouse gases and their impact, especially after the Paris Agreement, as well as what the climate in Iraq has reached as a result of the rise in greenhouse gases, the first of which is the phenomenon of high temperatures.

4.1 Sources

- the first source of these gases is fossil fuels of all kinds, and what causes the most is the efficiency of the combustion processes of fossil fuels, as they release large amounts of carbon dioxide gas (39).

- causing the destruction of the ozone layer and the arrival of harmful ultraviolet rays to the surface of the earth. Affecting the vegetation and animal cover and causing serious damage to human health, but the effects are not limited only to the increase in the diameter of the ozone hole (43)

One of the most important greenhouse gases and the most concentrated is carbon dioxide gas, where it was found to constitute more than 90% of the concentrations read in the sensors(49) ,and methane gas was by and after nitrous oxide gas and after chlorofluorocarbon gases that the most source of emission of these gases in Iraq is oil factories and factories, refining and production and electric power production plants (47,50)

this industry is the first industry in Iraq and the most used for energy production (48)

, followed by small industries such as cement industry if asphalt industry As well as heavy water treatment plants and other sources of oil and fossil fuels is the first source of these gases in the world in general and in Iraq (39).

The percentage of carbon dioxide emission in Iraq since 1927 was 0.07 tons per year to the highest percentage is 5.34 tons together in 2017, but the percentage decreased in 2021 to 4.26 tons per year(47,51)

but in Iraq there are no studies that determine emissions of other greenhouse gases as the sum of the types of sources for them, as the studies dealt only with emissions from the oil industry in its various branches, as well as gas concentrations in a specific period of time,

Sources of gases The first source is the oil industry, which constitutes the largest and most emitting source, as carbon dioxide gas was emitted by 8000 gigatons in 2018, methane gas was 19 gigatons, and by 7 gigatons of nitrous dioxide gas (10,47)

It is followed by power plants, which depend on the use of fossil fuels, and the highest percentage was 58,000 gigatons in 2017, methane gas by 0.3 gigatons emitted from various fuels and 1,001 gigatons of nitrous oxide gas (50,51)

- As for the other sources, they are transport mechanisms of various kinds, but they are considered less than other sources, as the burning is not done with high efficiency inside the vehicle machines, and this is considered a condition for the presence of carbon dioxide gas,(52)
- Transport mechanisms are a source of carbon monoxide gas, unless the burning process is with high efficiency, causing it to be converted into carbon dioxide (36)
- and the other source is various industries such as cement, asphalt, bricks, food, detergents, road construction operations and residential complexes, where generators and energy production equipment based on fossil fuels are used for operation, and this in turn increases the emission of greenhouse gases, as well as the manufacture and maintenance of refrigeration devices and their abundant presence in Iraq, as it is the first source of chlorofluorocarbon gases (2,15).
- The last source is waste treatment plants and heavy water treatment in Iraq as a whole, most of these stations lack maintenance and basic foundations for the treatment and disposal of waste according to international environmental laws,(53)
- where the disposal of solid waste by burning or landfill, and both cases produce large amounts of methane gases, carbon oxide and chlorofluorocarbon gases (45).
- in addition to most of the different pollutants, and heavy water treatment plants produce large quantities of nitrous dioxide gas and hydrogen sulfide gas, which are the cause of odor. In addition to methane gas as a basis for organic matter, this waste is not only a source of air pollution or greenhouse gases, but it is also a source of water and soil pollution (54)
- Waste and heavy water treatment operations are considered environmental management plans to reduce emissions.
- It is also seen in some parts of the country that areas lack a sewage station as well as a waste collection station, which makes it accumulated in the streets of the region, releasing gases as a result of natural decomposition and also burning them by the population to get rid of bad manifestations (38)

4.2 Effects

The effects of greenhouse gases are common all over the world, especially in the Middle East, because countries adopt fossil fuels as the first source of energy, but Iraq's neighboring countries also suffer from common problems and sources of gases.

- The first effect that puts most of the effects in its possession is climate variability. Iraq has seen a clear fluctuation in the climate, the first of which is the rise in temperatures (55)
- as they rose in recent years from 23.7 degrees Celsius in 2000 to 25.2 in 2017, an average of 0.33 per year, and this is what we are heading High temperatures and reducing the duration of winter in Iraq and also affected the percentage of rain in the country, causing drought, especially in the southern regions of the country due to the low rates of precipitation by 0.88 mm per month and also by 5.83 mm per month in the western regions of the country, unlike the high percentage of precipitation in the north by 2.4 mm per month, (39,43)

- due to the high temperatures and the lack of rainfall, this in turn affects the storage of water bodies such as the Iraq River and the Shatt al-Arab and ground water budget (33,56)
- In addition, high temperatures and increasing heat waves cause a decrease in plant productivity and a shortage of foods (54).
- The drought and dust storms are a result of pollution and also a cause of pollution (57).
- the lack of green spaces caused a rise in carbon dioxide gas concentrations according to the nature cycle and the burning of these forests causes a large release of organic matter in addition to carbon dioxide and methane and the rise of these greenhouse gases caused a rise in temperatures causing damage to plant covers (40,58)
- , as the rate of dryness of the lands ranges from 82% to 87%, most of which are in the southern and western regions compared to the north of the country (58)

All problems have generated social and economic pressure on the country in addition to the environmental aspect, such as the migration of animals and the impact on biodiversity such as the marsh environment in recent years, and the migration of village residents to cities due to poor plant production and the lack of job opportunities to live, which generated great momentum on cities and because they lack environmental management in most of their parts and activities within cities, this led to high levels of pollution of all kinds, causing heavy damage(59)

5. Environmental management plans

Before starting to develop an environmental management plan to solve the problem we face, several questions must be asked.

- What is the role of agencies and policies in the success of the management plan?
- Does strict regulations for various activities and industries play a role in solving the climate issue?
- Does environmental guidance and education play an important role in reducing emissions?
- How can you control an activity by reducing emissions?
- What is the role of city planning in the issue of global warming?
- Do the proposed alternatives serve all citizens and serve the country's industrial activity, such as employing manpower and creating job opportunities?
- What is the role of establishing sanitary landfill and waste treatment plants within the foundations of the global environment?

The environmental management includes all aspects of a project and activity, as well as the excellent environmental management is not limited only to the work of the Ministry and directorates of the environment, it is closely related to the role of politics and legislative laws before starting to evacuate the project or demolish it The country is previously weak foundations and weak in the aspect of the application of legislative laws, which made the establishment of factories and various activities not subject to full control The first step to successful management is to enact legislative laws and work out and impose high financial fines On the defaulters, the legislative law shall be a law that preserves all rights in addition to the environment and its regulations without allowing any damage when building an industrial, commercial or other activity, and the step of the laws is divided into two stages.

- The first stage includes all old activities of all kinds, where laws are imposed regarding the periodic maintenance of the factory's equipment if it is an industrial activity, treatment and control of pollutants emitted from these activities, as the law includes continuous periodic control over all activities after imposing instructions in order to make pollutants less Which obligated them to treat the pollutants released as well as activities that lack all the foundations such as factories making white plaster where these laboratories burn crude oil in large quantities in large areas without the presence of chimneys to filter the pollutants released and maintenance

- control of heavy water treatment plants maintenance of basins and pipes and impose a fine where must be continuous follow-up by the legal authorities to visit the various activities
- Giving full powers to the environmental directorates and their full supervision of all activities and projects that will be established, where the project is evaluated by the environmental, economic, social and industrial, and all aspects are under the influence of the surrounding environment of the area surrounded by the project and then at the country level Environmental management includes laws for the establishment and construction of various types of activities, materials used and produced, manufacturing methods, fuel used or transportation, etc. Occupational safety and health for workers and staff from the first step to the end and the imposition of laws Working with it reduces the products and waste that pollute the environment, including greenhouse gases.
- The role of institutions and legislative forces, as well as the role of environmental institutions, is to disseminate educational and educational information to citizens through educational papers, television channels, the Internet, and the distribution of papers. The law legislates to the owners of various activities to abide by them and make financial loans to the owners of simple agricultural or industrial activities for the maintenance of projects and waste management, and then the work of the legislation law begins for those who fail to apply.
- in addition to that must impose laws on the citizens themselves such as imposing a fine or imprisonment for each person who did an activity Harmful to the environment such as burning waste or burning green spaces or starting a project without referring to the environmental management
- One of the proposed management plans after the enactment of laws and strict penalties on defaulters and the study of projects is to control the sources of emissions and reduce them either by developing an alternative plan for the activity or treating the activity environmentally where to reduce the emission of greenhouse gases in Iraq, whose main source is fossil fuels and electric power generators, it is proposed to go to the establishment and construction of solar cell power stations to supply electricity, as it is considered renewable energy that is not polluted and suits the Iraqi climate, for example, in Najaf or Anbar province due to the presence of a large desert Where when reducing the tension on conventional power stations, gas emissions are reduced, which causes a clear decrease in them, and also the tendency to use kinetic energy for tides generated by turbines to produce electricity The use of biomaterials resulting from organic waste, where when fermented, two methane gases are released. Ethane is considered a bionatural gas less polluting than fossil fuels when burned.
- Maintenance of electricity production stations periodically by establishing chimneys with electronic insulators and filters to prevent the exit of fine particles and chemicals such as the presence of water molecules to prevent and reduce the emission of gases resulting from burning fuel as a result of chemical reaction and this also applies to generators located in residential areas and private generators where these generators emit large amounts of greenhouse gases, in addition to building chimneys for you type according to its energy, also the cultivation of the area that surrounds the generators has a great impact where plants inhale gases As carbon dioxide as a source of energy, which in turn reduces, but in a very small way, emissions The other step is what concerns factories and industrial activities, the first of which is the oil industry, as it is considered the first industry in Iraq and the most emitting of gases for other industries, so an optimal method must be followed to treat its various industrial waste, as well as the use of recyclable and less polluting raw materials Relying on high-altitude chimneys with the advantages of an environmental management dish that reduces the emission of gaseous pollutants, as is the case in Electric power plants also applies to the oil industry
- One of the most important sources of gases in Iraq is landfill plants for waste and heavy water treatment plants, so landfill plants with high qualities must be established committed to the rule of separating waste according to its types, and then burying part of it and recycling the other and fermenting organic materials to obtain organic fertilizer used in agriculture and also obtaining natural gas used as a source of energy, these are considered methods of renewable energies and it is better to be stations and

sites of landfill and dealing with waste away from the city and its suburbs This is what we discuss in the importance of city planning as it worked in Germany Transport according to the statistics of traffic directors Iraq the country has huge numbers of cars exceeding more than millions and all of these cars use improved and non-improved fuels producing greenhouse gases and other air pollutants so it is better to activate the common transport lines and link them between residential areas and other activities for the purpose of reducing the number of cars on the streets and thus reduce the percentage of pollution in general and greenhouse gases in particular and represent the process of transporting the subscriber Carrier facilities and train lines between cities as well and the construction of pedestrian and bicycle streets after the spread of the phenomenon in pictures civilisational

- One of the environmental management plans to reduce these emissions is to study city planning in a smarter way that is beneficial to the citizen and the surrounding environment, how is this done? Where in other countries the city is planned on the basis of activities, it is preferable to keep industrial and operational activities away from neighborhoods and residential cities and build them in areas that fatten industrial cities under the conditions of environmental assessment, where in this way emissions are reduced in cities from one of the sources, as controlling one or two important sources makes a big difference in the percentage of emission and the phenomenon of climate change in the future, and also one of the steps of planning the right cities is to create vast green spaces between all Residential, commercial, industrial and other areas where green spaces and parks help to absorb greenhouse gases and reduce the phenomenon of desertification and drought, and in turn cause a balance in temperatures and the consequences after that, for example, when establishing a residential complex, it is better first to determine the green space before building and construction

Strictly prohibiting cutting and destroying vegetative cover imposed severe penalties ending with imprisonment and the establishment of a small heavy water treatment plant for each residential neighborhood linked to large plants, preventing the pouring of this water into river levels with periodic maintenance and monitoring, and establishing waste recycling stations and exploiting it in industry as raw materials, which in turn helps the country economically, causing the employment of many manpower.

The construction of renewable energy production plants and city planning within global controls not only reduce emissions, but also have a major role in reducing pollutants of all kinds in the long term, for example, fermented organic materials are used in landfill plants as organic fertilizers in the field of agriculture, where chemical fertilizers are gradually abandoned, reducing their production, use and negative effects, as well as reducing the use of improved fuels in cars and transportation, reducing the emission of carbon dioxide and other oxides. The series of environmental management plans is an integrated chain that starts from dou and educating citizens as a first step to enacting and imposing sanctions.

Conclusions

The current study is an understanding and explanation of greenhouse gases and their impact in Iraq in general in the near and far term, as the study proved the lack of integrated studies and research that have studied the sources of emission of different greenhouse gases, where all of them measure the concentration of these gases in a unit of time and seasonal, and considering the changes in terms of temperature, humidity, wind and others, as all of them affect the proportions, but it is necessary to know the emissions and their different sources and compare them globally All proposed plans for gas management Greenhouse and reduction are plans based on annual general emissions of gases from various activities, as carbon dioxide emissions have been studied periodically because it is the first greenhouse gas in the world and the most impactful, but in Iraq its emission has been studied with other gases in industrial sources, namely oil, and with the use of fossil fuels to produce electricity, which are the largest problem in the whole country.

The weak role of legislative law in fighting factories that violate international law in the environmental management of projects has occupied a large area of global warming problems and treatment and it has

been found that the role of the citizen is very weak to reduce emissions, unlike his role in emission-causing activities and weak management and infrastructure in city planning made sanitary landfill and water treatment plants sources of large emissions of greenhouse gases and pollutants Orientation to the use of the green energy pyramid, i.e. the trend towards the establishment of renewable energy plants may help in Reducing emissions, but it has faced rejection in recent years due to the country's policy, which has placed the weight on fossil fuels as the first source of energy in Iraq. The weak role of legislative law in fighting factories that violate international law in the environmental management of projects has occupied a large area of global warming problems and treatment and it has been found that the role of the citizen is very weak to reduce emissions, unlike his role in emission-causing activities and weak management and infrastructure in city planning made sanitary landfill and water treatment plants sources of large emissions of greenhouse gases and pollutants Orientation to the use of the green energy pyramid, i.e. the trend towards the establishment of renewable energy plants may help in Reducing emissions, but it has faced rejection in recent years due to the country's policy, which has placed the weight on fossil fuels as the first source of energy in Iraq.

Knowledge Gap

Despite the orientation of researchers and scientists and their demand to know the causes of global warming and its sources, all previous studies and research that were conducted dealt with and this does not play a major role in management plans, and studies were also found that dealt with emissions for one type of activity only and for a specific period of time like the research about oil production and electrical energy production , and because the aim of the research paper is to propose environmental management methods to reduce greenhouse gas emissions and reduce the manifestations of change. It is very necessary to obtain an integrated database represented by studying and obtaining emissions of greenhouse gases from various sources and activities to know the amount of gas emissions periodically and whether the readings are within international standards or less or more and in the light of emissions and to know which activity and source is the highest emission according to (IPCC)

An environmental management plan is proposed to address and reduce emissions and in turn contributes to reducing gas concentrations in the atmosphere, which decreases annually if the management plan is adhered to.

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