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Sustainable development and climate change in Iraq

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ABSTRACT

The world is now witnessing clear climate changes that have arisen in the Earth's surface temperature to 1.5 C°. Therefore, this study aimed to find out the reasons for the rise in the Earth's temperature Based on four main indicators of climate change – greenhouse gas concentrations, sea level rise, ocean warming, and ocean acidification, the thermal gas concentration was chosen, and the thermal gasses that cause it. This available source https://www.macrotrends.net/countries/IRQ/iraq/ghg-greenhouse-gas-emissions and CO_2 and Greenhouse Gas Emissions - Our World in Data was relied upon to take the recorded concentrations of thermal gasses to investigate their concentration in the world and Iraq. This research

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showed that the greenhouse gases produced in the world's atmosphere are much higher than in the atmosphere of Iraq, contributes to greenhouse gas emissions and ranks 12, based on the Similar Country Ranking of 12 of CO2 equivalent. In conclusion, this data answers the question of this research and finds that Iraq is influential and affected by climate change.

Keywords: Atmosphere, climate change, CO2 emissions, sustainable development.

الملخص

يشهد العالم الآن تغيرات مناخية واضحة أدت إلى ارتفاع درجة حرارة سطح الأرض إلى 1.5 درجة مئوية، لذلك هدفت هذه الدراسة إلى معرفة أسباب ارتفاع درجة حرارة الأرض بناءً على أربعة مؤشرات رئيسية لتغير المناخ - تركيزات الغازات الدفيئة وارتفاع مستوى سطح البحر واحترار المحيطات وتحمض المحيطات، تم اختيار تركيز الغازات الحرارية والغازات الحرارية المسببة لذلك، وتم الاعتماد على هذا المصدر المتاح https://www.macrotrends.net/countries/IRQ/iraq/ghg-greenhouse-gas-emissions *و CO_2 وانبعاثات الغازات الدفيئة - عالمنا في البيانات لأخذ التركيزات المسجلة للغازات الحرارية للتحقيق في تركيزها في العالم والعراق، وأظهر هذا البحث أن الغازات الدفيئة المنتجة في الغلاف الجوي للعالم أعلى بكثير من تلك الموجودة في الغلاف الجوي للعراق، ويساهم العراق في انبعاثات الغازات الدفيئة ويحتل المرتبة 12، بناءً على ترتيب الدول المماثلة للكيلو طن من مكافئ ثاني أكسيد الكربون. وفي الختام فإن هذه البيانات تجيب على تساؤل هذا البحث وتجد أن العراق من أكثر العراق تأثيراً وتأثراً بالتغيرات المناخية.*

الكلمات المفتاحية: الغلاف الجوي، تغير المناخ، اتفاقية باريس، انبعاثات ثاني أكسيد الكربون، الغازات المسببة للاحتباس الحراري، التنمية المستدامة.

INTRODUCTION

Iraq is the world's 5th most vulnerable country to global warming, facing environmental hazards such as rising temperatures, drought, water shortages, and dust storms. The crisis disproportionately affects vulnerable communities, with 94% of displaced populations in southern governorates attributing

displacement to water shortages. Iraq's deep social divides and inequalities create a risk for a systemic crisis, with physical impacts and financial risks linked to oil revenues (Hansen, et al, 2021). The rise in the Earth's temperature to 1.5 °C, as shown in Figure 1 (Hadi, et al, 2024) has led to clear climate changes affecting human health, the environment, and the economy.

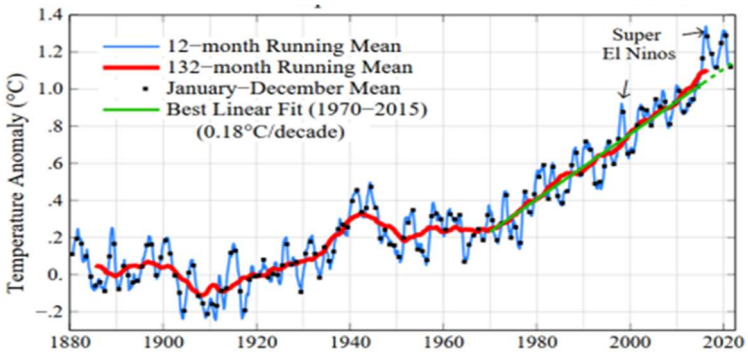

Figure 1. Average temperature of the earth (Hadi, et al, 2024).

It is known that the main reason for this rise in the Earth's temperature is the emission of greenhouse gases from various human activities. Causes of climate change Carbon dioxide (CO2), methane (CH4), and water vapor (H2O) are greenhouse gases found in the atmosphere (Ritchie & Roser, 2023; Prasad, et al, 2024). Energy is transmitted from the Sun to the Earth as a short-wave beam. It does not interact strongly with greenhouse gas molecules, so it reaches the Earth's surface. Therefore, the United Nations established a convention on climate change. This agreement was pledged under the Paris Agreement to limit this warming to 1.5°C (Meinshausen, et al, 2022; Baidya & Saha, 2024). The United Nations has taken several measures to reduce the emission of thermal gases. However, greenhouse gases are still released into the air by human activities. If alleviated atmospheric arrangement at today's GHG volumes, it would be getting about

0.5-1°C more warming, In general, the largest industrialized countries are at greater risk of emitting more greenhouse gases into the atmosphere. In Iraq limited local industries are being, and this would not contributed to climate change as a result of greenhouse gase emissions. However there are sources of emission of greenhouse gases from several different activities in Iraq, such as electric generators, oil refining wells, and various factories emitting emissions (Ajam, et al, 2024). Therefore, this study aimed to investigate whether Iraq is influential or affected by climate change. Websites sources were relied upon to take the recorded concentrations of the contributions to investigate their values in the world and in Iraq.

METHODOLOGY

This source https://www.macrotrends.net/countries/IRQ/iraq/ghg-greenhouse-gas-emissions (www.macrotrends.net) and CO_2 and Greenhouse Gas Emissions - Our World in Data (Our World in Data) were relied upon to take the recorded concentrations of thermal gases to investigate its concentration in the world and in Iraq.

RESULTS AND DISCUSSION

According to the Similar Country Ranking of kt of CO2 equivalent, China was on the top on the emisson contribution and Iraq contributed on the rank 12 (Figure 2) .

The difference in CO_2 emissions among income groups is significant, with high-income countries having twice the global average, lower-middle-income countries having less than half, and low-income countries having one-fifteenth of the global rate. China and the US are the largest contributors, while oil-rich countries like Iraq is the largest emitter. Methane emissions per capita range from 0.8 to 1.5 tCO_2e, with countries like China, Russia, and Brazil

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being major contributors.

Figure 2. Similar Country Ranking of kt of CO2 equivalent, based on the sources https://www.macrotrends.net/countries/IRQ/iraq/ghg-greenhouse-gas-emissions

Figure 3 shows the change in Greenhouse gas emissions in the world of the period from 1850 to 2021, measured in CO2 over a 100-year . The concentrations reached to over 50 billion tonnes as a results of short-term pledges (Meinshausen, et al, 2022). Contrary , Figure 4 shows the changes in CO2 concentrations in the Iraq from year 1927 to 202, and the concentrations reached over 4 tonnes. The measured in CO2 produced in the atmosphere of the world are much higher than in the atmosphere of Iraq, and Iraq contributes to greenhouse gases emissions (Gafsi & Bakari, 2024).

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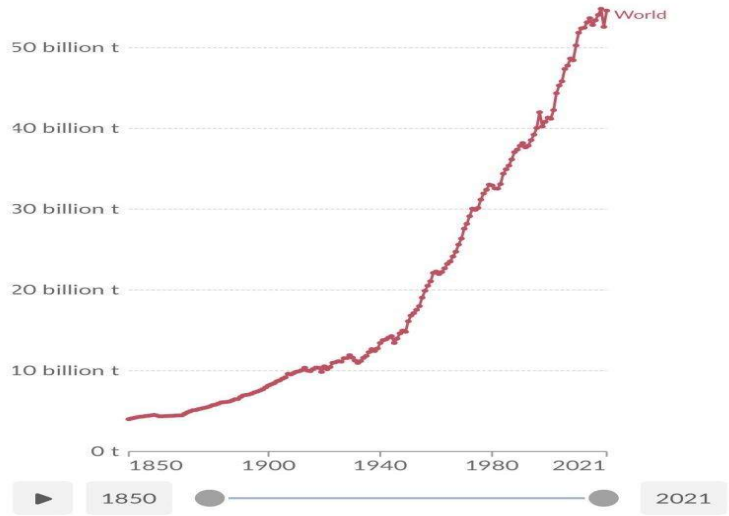

Figure 3. shows the change in Greenhouse gas emissions in the world based on the sources of Greenhouse gas emissions - Our World in Data.

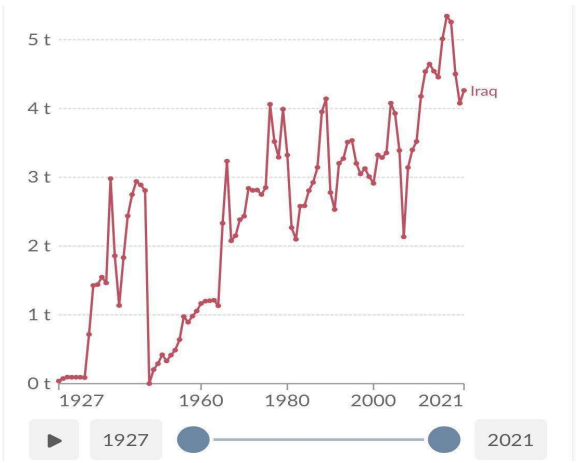

Figure 4. shows the change in Greenhouse gas emissions in Iraq based on the sources Iraq: CO2 Country Profile - Our World in Data.

In 2020, the CO2 emissions in Iraq declined in contrast to 2019, and that could be because of the COVID-19 pandemic.

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Continuously, the emissions reduced to a level lower than in 2019. Iraq should do steps to overcome the problems of rising temperatures in Iraq as a study by (Hassan, 2021) predicted that the minimum and maximum temperature of Iraq will be rise to 0.22 ℃ and 1.76 ℃, respectively by year 2099.

On the other hand, Europe countries do policy-linked emissions that reduced GHS and more reductions would be before the 2000s as a result of longer-term progress (Lamb, et al, 2022).

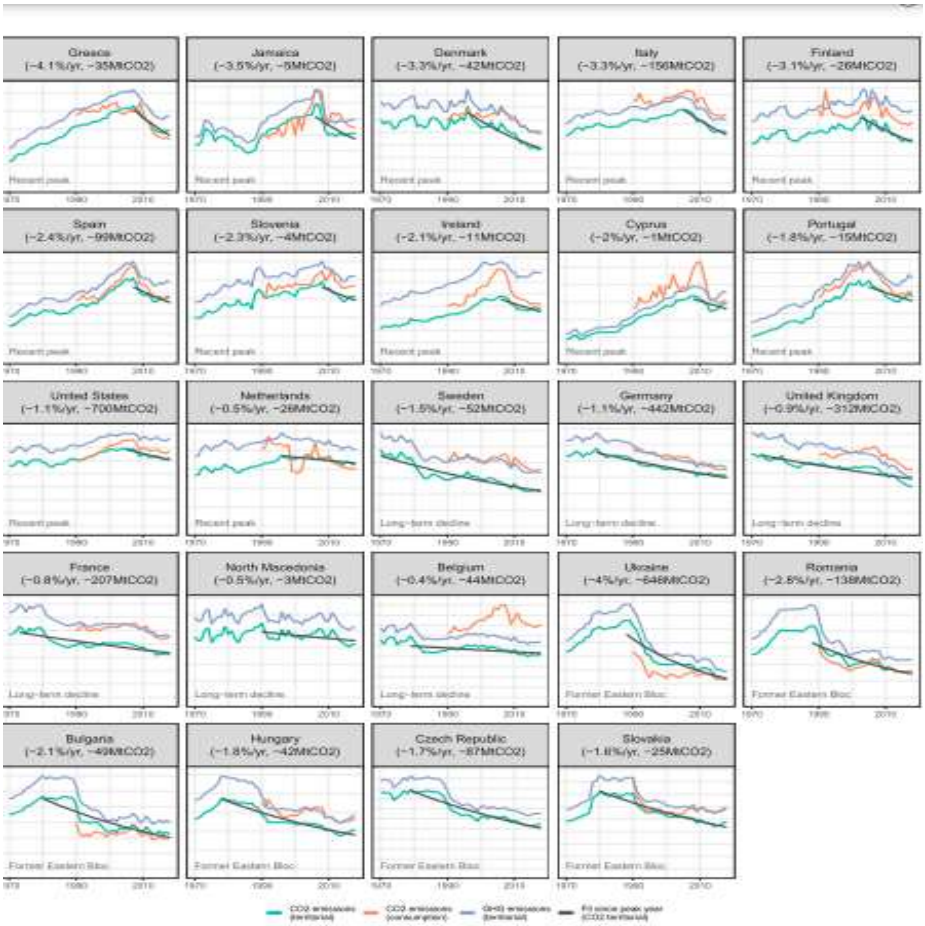

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Figure 5. 24 countries sustained GHS reductions.

CONCLUSIONS

Glasgow Climate Pact1and United Nations Climate Change Conference (COP26) effort to retune back the earth`s atmosphere to its normal temperature. However, still countries produce GHS and it has been suggested that if countries take their actions in reducing the emission and applying the agenda of Glasgow Climate Pact1and COP26, they would just keep 2 degrees Celsius. This study find that Iraq is Iraq influential and affected by climate change. The greenhouse gases produced in the atmosphere of the world are much higher than in the atmosphere of Iraq, and Iraq contributes to greenhouse gases emissions and on the rank 12. Therefore Iraq requires policies and actions to reduce emission and do activities to cope the problem. Iraq not just do reducing of GHS emissions but needs to replace coal use with greener energy sources.

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