Volume04, Issue 05, 2024,
Publish Date: 11-05-2024
Doi https://doi.org/10.55640/ijbms-04-05-17

INTERNATIONAL JOURNAL OF BUSINESS AND MANAGEMENT SCIENCES (Open access)

The Carbon Footprint and Its Impact on Sustainable Accounting

An Exploratory Study of the Opinions of A Sample Of Employees At Al-Joud Company

Ali Mohammed Hussein Alfartoosi
Department of Accounting. College of Administrative Sciences, Al-Mustaqbal University, Iraq

Safa Hatem Hatef
Department of Accounting. College of Administrative Sciences, Al-Mustaqbal University, Iraq

Heba Abdel Hussein Negm
Department of Accounting. College of Administrative Sciences, Al-Mustaqbal University, Iraq

Maryam Mohamed Abdel Hussein
Department of Accounting. College of Administrative Sciences, Al-Mustaqbal University, Iraq

ABSTRACT

Energy is the backbone of modern life and the lifeline of many sectors. In contrast, it is the leading cause of climate change. The magnitude of this problem, considered one of the global environmental problems that have become a concern for all of humanity, has prompted people to search for ways to reduce these emissions and then protect the environment and achieve accountability. Sustainability can be measured through a set of indicators, including the environmental footprint, which was used initially, and the carbon footprint, which relates to carbon emissions only. This is what we will highlight in this research paper as we try to understand the carbon footprint concept and its impact on sustainable accounting.

KEYWORDS: a set of indicators, including the environmental footprint, which was used initially, and the carbon footprint.

INTRODUCTION

The term carbon footprint is considered one of the images of the" environmental footprint", and it is considered a more comprehensive measure of the amount of use of Earth's resources.the environmental footprint is explained by the area of land that any order will need to support everyone on this planet. if all resources are used at the same rate as they are used to, for example, in America, this figure rises from three sizes of land, according to the Global Footprint Network

Quite simply, the human carbon footprint is the volume of greenhouse gases released into the atmosphere due to human actions, these carbon calculations can be applied in an individual's life or certain aspects of their lifestyle or housing

The collective carbon footprint of mankind is affected by the Earth's climate as a whole, and accordingly, the higher the carbon footprint, the greater the peak of global warming in the atmosphere, which indicates that one of the best solutions is to reduce the carbon footprint 2.

In addition, all inputs of production processes have an environmental and carbon footprint, starting from the life cycle of the product and ending with its consumption to end with the use of fuel during production processes 3. An example of this is the quality laboratories affiliated to the thresholds company, where their products are considered basic products and the need for them increases as their consumption increases, and their products depend mainly on the raw materials used during the production processes of chemicals and organic materials for the production of various detergents, agricultural fertilizers and other products to be completed using fuel during production processes and even during transportation..

Research Methodology

The research is built according to the descriptive-analytical approach to describe the research variables and the nature of the relationship between them.

The Research Problem

The continuous and increasingly rapid degradation of Environmental Systems explains the growing need for sustainable accounting.accounting management needs tools and methods to calculate the demand for environmental resources and calculate the sustainability of these resources. therefore, the absence of the carbon footprint in the industrial side means the loss of important accounting tools that make sustainable accounting a measurable element by measuring human consumption of its vital area compared to the ability of this vital area to renew itself.

Importance of research

Carbon footprint research is of great importance in the pursuit of sustainable accounting. With a proper understanding of the carbon footprint of a variety of activities and products, the environmental and economic efficiency of these activities can be improved and a balance between current needs and the needs of future generations can be achieved. Carbon footprint research can also support policy and legislative decision - making based on strong scientific evidence on climate change and its impact on the environment and the economy.

Research objectives

Identify the carbon footprint and the most important reasons for its increase during and after the production processes of the quality factor, as well as the most important effects of it to reach solutions that help reduce the carbon footprint of these and various other industrial plants and reduce their negative effects on the environment.

Research hypotheses

1. There is a statistically significant

relationship between reducing the carbon footprint and achieving sustainable accounting.

Limits of Research

Spatial limits: the research is limited to studying the carbon footprint of the quality factor and its environmental and economic impacts and finding actual solutions to reduce them.

Time limits: the duration of the study is within four months from 1/11/2023 to 1/3/2024.

Previous Studies

These studies aim to understand and analyze the carbon footprint and its role in climate change. Previous studies include multiple analyses of carbon emissions for different sectors and activities. These studies also address the effects of the carbon footprint on the environment and public health. Previous studies on the carbon footprint are an important reference for the development of policies and effective decision-making to reduce carbon emissions and achieve sustainable accounting ,as stated in the study of Amani Abdul Salam and Mohammed Saleh Turki 2019, 2015 5, 4 .

Adly Abu Tahoun and Khamis Abdel Rahman studied the extent to which the carbon footprint is affected by several factors. These factors include production inputs used in industrial, agricultural and transport processes. Consumer behaviors and energy use also affect the level of carbon footprint. In addition, climate change and the sustainability of ecosystems affect the size and quality of the carbon footprint. Understanding these factors is central to the development of strategies to reduce the carbon footprint and achieve sustainable accounting study of Ali Abu Tahoun 2003 ,Khamis Abdul Rahman 2009 7, 6.

Carbon footprint measurement techniques are based on estimating and calculating greenhouse gas emissions associated with human activities. These techniques include the use of internationally recognized emission measurement models and tools. These technologies provide reliable and accurate data on the amount of carbon emitted, contribute to environmental impact assessment and sustainable decision-making. Carbon footprint measurement techniques should be employed to deal with the environmental challenges associated with climate change and achieve sustainable accounting.Naim al-Ansari contributed to the study and understanding of methods for estimating and calculating the carbon footprint came to the study of researcher Naim Mohammed Ali Al-Ansari 2009.

The carbon footprint causes negative environmental impacts. In his study, Hani Obaid explained the role of the carbon footprint in promoting the increase in thermal greenhouse carbon emissions, which leads to an increase in global temperatures and climate change. Global warming caused by the carbon footprint is one of the main causes of rising sea levels and its negative effects on coastal and biological ecosystems. The carbon footprint also leads to air pollution and water pollution, their effects on biodiversity and the depletion of Natural Resources. In order to preserve the environment and achieve sustainable accounting, it is necessary to achieve a reduced carbon footprint and adopt a more sustainable environmental behavior Hani Obaid study 2000 9.

The First Axis: The Concept Of Carbon Footprint

The carbon footprint is the sum of all greenhouse gases (carbon dioxide, methane, nitrous oxide, etc.) that are released into the atmosphere due to some activity, either directly or indirectly.

When driving your car it is easy to understand that this activity has a carbon footprint,but when you ride your bike, do you imagine that this activity has a carbon footprint Of course, for him, although the bike does not emit gases by itself, it was manufactured in an industrial unit, and then a diesel truck delivered it to the local bicycle store, and reading a book while sitting on a sofa also has a carbon footprint because the book was manufactured and then transported to the local book store.

The carbon footprint of each person, company or activity is a calculation of the human impact on climate change, air and water pollution, pollution of Natural Resources, and, as expected, people in western economies may have a carbon footprint 4-6 times larger than the carbon footprint in

developing countries. 10

How the carbon footprint can help us fight climate change

The carbon footprint is a valuable tool for measuring the contribution to climate change by individuals, enterprises, products and services, and more, for example, by calculating the industrial carbon footprint, the industry can better understand the main sources of emissions and find ways to reduce them. 11

Some of the biggest advantages of measuring the company's carbon footprint:

* Help you understand the main sources of emissions in your organization.
* Enables you to delve deeper into your company's activities and identify the most important challenges as well as opportunities.
* Facilitates stakeholder participation.
* Enables you to become more aware of your consumption and contribute to making more responsible decisions.
• To be competitive in the market, you must implement sustainable carbon reduction strategies.
* Estimating a company's carbon footprint can help improve the reliability and validity of data used in environmental, social sustainability and governance (ESG) reporting. 12

What can you do to reduce your carbon footprint

As we go about our daily lives, releasing greenhouse gases into the atmosphere, by reducing our carbon footprint, we can reduce greenhouse gas emissions.

The choices we make every day in our homes, our travels, the food we eat, what we buy and dispose of can help ensure a stable climate for future generations, a vegetarian diet, for example, is more environmentally friendly than a diet rich in meat.

According to a new study published in the American Journal of Clinical Nutrition in February 2022, beef eaters can reduce carbon emissions by up to 48% by replacing non-beef meals with just one serving per day for a more environmentally friendly alternative. 13

Other lifestyle changes include using a bicycle instead of a car to travel, or you can use renewable energy to power your car and electronic devices.

For companies, reducing the carbon footprint is crucial in terms of compliance and stakeholder engagement, if you want to be successful in business, you must adopt sustainable strategies to reduce emissions

For emissions that companies are unable to reduce or reduce, they can be compensated – that is, companies can invest in activities that are so environmentally sustainable that they capture the same amount of greenhouse gas emissions that the organization or activities bear.

For example, if the company's stakeholders cannot avoid flying or traveling long distances, one of the ways to compensate for emissions is to donate money to environmentally sustainable projects, located on

Everyone, including individuals and the private sector, has a responsibility to make the world a cleaner and more environmentally sustainable place. 14

Etiology of the carbon footprint

Since the Industrial Revolution, greenhouse gases have increased significantly. According to 2017 data, carbon dioxide (CO_2) levels are 142% of what they were before the Industrial Revolution. Methane is 253% and nitrous oxide 121% of pre-industrial revolution levels. Energy-driven consumption of fossil fuels has led to a rapid increase in greenhouse gas emissions, which has led to a warming of the Earth. In the last 250 years, human activities-such as burning fossil fuels and cutting down carbon - absorbing forests-have contributed significantly to this increase. In the last 25 years alone, emissions have increased by more than 33%, mostly from carbon dioxide, accounting for three quarters of this increase. 22

Reducing the carbon footprint

To address these challenges, there are many efforts aimed at developing more resource-and energy-efficient artificial intelligence technologies, enhancing the sustainability of their applications through the use of renewable energy sources and applying more effective environmental practices.

In the context, the academic advisor at San Jose

State University in California, talks about the tools and policies through which the carbon footprint of artificial intelligence technologies can be mitigated, as follows: 23

1. Improving computing efficiency: enhancing computing efficiency through hardware design improvements and developing more efficient algorithms can reduce energy consumption.
2. Effective model training: the energy consumption of model training can be reduced by optimizing processes, reducing training cycles, and using techniques to optimize neural network training.

Approval level	standard deviation	SMA	Paragraph
I agree	0.91	3.88	1.
I agree	1.05	3.60	2.
I agree	1.05	3.73	3.
I agree	1.01	3.79	4.
I agree	1.02	3.55	5.
I agree	1.12	3.67	6.
I agree	1.22	3.52	7.
I agree	1.05	3.63	8.
I agree	1.04	3.65	9.
I agree	1.03	3.63	10.
Approval level	1.058333333	3.6475	Total

The table of the researcher's work based on the questionnaire data

It is clear from Table (1) that the total arithmetic mean of the respondents ' responses to the paragraphs of the carbon footprint variable amounted to (3.6475), which is within the level of (agree) in the standard of judgment, and the standard deviation reached (1.058333333), this indicates that the answers are not scattered, as the averages of all paragraphs of this variable fell within the level of (agree) in the standard of judgment, which indicates that there is agreement among the respondents on expressed by the phrases of this variant.

Dependent variable (sustainable accounting)

Table (2) arithmetic averages, standard deviations and the level of approval of the responses of research personnel to paragraphs

The dependent variable of sustainable accounting

Approval level	standard deviation	SMA	Paragraph
I agree	1.06	3.64	1.
I agree	1.02	3.53	2.
I agree	0.96	3.73	3.
I agree	1.06	3.63	4.
I agree	1.03	3.60	5.
I agree	1.11	3.51	6.
I agree	1.17	3.76	7.
I agree	0.93	3.76	8.
I agree	1.03	3.63	9.
I agree	1.05	3.625833333	Total

The table of the researcher's work based on the questionnaire data

It is clear from Table (2) that the total arithmetic mean of the respondents ' responses to the sustainable accounting paragraphs amounted to (3.625833333), which is within the level of (agree) in the standard of judgment, and the standard deviation reached (1.05), which indicates that the answers were not scattered, and that the averages of all paragraphs of this variable fell within the level of (agree) in the standard of judgment, which indicates that there is agreement among the respondents on the variable.

Testing the two main hypotheses of the study

In this paper, each hypothesis will be verified separately, and for this purpose, the correlation between the independent variable and its relationship with the dependent variable was calculated to indicate the nature of the correlation in terms of value, direction and significance, and a simple linear regression was used to indicate the effect of the independent variable in the dependent variable. the following is a detailed:

The first main hypothesis: it states that "there is a statistically significant correlation between the carbon footprint (as an independent factor) and sustainable accounting (as a dependent factor) in the organization under consideration "

To indicate whether the hypothesis is accepted or not, the Pearson correlation coefficient between carbon footprint and sustainable accounting was calculated as follows:

Table (3) statistical outputs of the relationship between carbon footprint and sustainable accounting.

Significance level	Correlation coefficient	The dimension
0.01	0.783**	Carbon footprint

Through Table No. (3) it is clear what follows:
In order to confirm the strength of the correlation relationship between the total independent variable and the dependent variable, the correlation coefficient was measured, which reached a value of (0.783) at a significant level (0.01), and in light of this and the validity of the four sub-hypotheses, we say the validity of the first main hypothesis, which states that " there is a statistically significant correlation between the carbon footprint (as an independent factor) and sustainable accounting (as a dependent factor) in the organization under consideration
The second main hypothesis: it states that " there is a statistically significant impact of the carbon footprint in sustainable accounting in the organization under consideration "
To determine whether the hypothesis is accepted or not, a simple linear regression analysis was performed between the carbon footprint and sustainable accounting as follows:
1-the first sub-hypothesis: the following are the statistical outputs of the analysis of simple linear regression

Table (4) linear regression coefficients of the carbon footprint effect in sustainable accounting

Significance level	Vale T	Vale B	Constant	Significance level	Vale F	The coefficient of determination R2	The dimension
0.01	3.010	0.782	Gradient constant	0.01	270.300	0.710	Carbon footprint
0.01	15.176	0.825	Sustainable accounting				

With a degree of freedom (94) and a level of significance (0.01) = 1.96
Table (4) above shows the statistical analysis of the second main hypothesis test, from which we conclude:
1-B (B) (0.782)=(71٪). (R) = (0.7102 2=).

CONCLUSIONS

1-Iraq has multiple geographical characteristics that have played a significant role in the existence and prosperity of Iraq since time immemorial. Its strategic location is an essential link between the East and the West and the best route of the dry canal to connect the East with the West.
2-Iraq's environmental footprint of production (excluding carbon) is 4.5 million hectares globally. However, the country's global biological capacity is a staggering (7) million hectares, indicating a significant potential for reducing its environmental footprint of consumption.
3-Iraq occupies the 58th place globally in terms of area, as the area of Iraq is about 435 thousand square kilometers.
4-at the social level, the situation was less developed" despite the attempt to work on finding social accounting matrices to link social variables such as labor force and income distribution with various measures of economic activity
5 - finally, understanding the links of sustainable accounting with the footprint finding the required policy, and balancing the economic, environmental, and social dimensions requires advanced research methods based on modern models of statistical methods
Recommendations
1-support the development of green bond

markets at the local level at the request of countries interested in developing green bond markets in local currency.

2-Adopt joint studies and academic research that serve the study of environmental financial innovations, such as green bonds at the regional and global levels.

3. strengthen international cooperation to facilitate cross-border investment in green bonds.

4-Egypt should seek to adopt and expand green financing to alleviate its environmental problems. This would involve incentives and grants of subsidies for environmental conservation activities.

5. Work on developing legislation and laws that oblige all companies to take the necessary measures to reduce environmental pollution and display ecological costs in the financial statements.

REFERENCES

1. Ahmed El Sayed El Naggar, the environmental footprint of a new hope for sustainable development in Egypt, The Daily pyramid website 2020.
2. Khamis Abdel Rahman Raddad, environmental indicators as part of sustainable development indicators, Arab Institute for statistical training and Research, General Authority for information, the second Arab statistical conference, Sirte, Libya, November 4-2, 2014.
3. UAE environmental footprint initiative, summary report, 2010-2007 Ministry of Environment and water, United Arab Emirates .
4. Mohammed Saleh Turki Al-Quraishi, introduction to economics and Environment, University Library, Eira publishing and distribution , Jordan , 2019.
5. Mohamed Sherif Abdel Salam hopes for global environmental citizenship among university students in the light of the national strategy for climate change in Egypt. Journal of the Faculty of Education. Assiut University 2015.
6. Ali Adly Abu Tahoun, human and Natural Resources Management and development, Alexandria, Egypt, 2003.
7. Khamis Abdel Rahman Radad, environmental indicators as part of sustainable development indicators, Libya, November, 2009
8. Naim Muhammad Ali Al-Ansari, environmental pollution is a modern risk and a scientific response, I, 1 Dar Tigris, Jordan,, 2009 .
9. Hani Obaid, man and the environment (energy systems, environment and population), i, 1 Dar Al-Shorouk publishing and distribution, Amman, 25 ,2000.
10. Abdel Fattah Hamed Ahmed Hamed. (2022). Zero-energy space design strategies to reduce the carbon footprint. Journal of Architecture, Arts and humanities.
11. Zidane, M. A. A., & Mohammed Abu Al-Hamad. (2022). A proposed strategic framework from the perspective of social planning to develop community awareness of reducing greenhouse emissions and the consequences of the carbon footprint. Journal of social work, 143-165.
12. Ali Adly Abu Tahoun, management and development of human and natural resources, without publishing house, Alexandria, Egypt,, 2003 p.15
13. Ouled boufar et al., ibid., pp. 61-66
14. Ibid., p. 66, para.
15. William (17 2 2008). "Footprint". The New York Times. Archived from the original on 2013-04-30. View it on 2024/20/2
16. Ahmed, Zeinab Abbas, " the role of urban space in enhancing social interaction over time, Karada region
17. Eastern region for the period 2010-2020 study case", doctoral dissertation submitted to the Center for urban and regional planning for scientific studies.
18. 24. Elsarou C, Talaat Mustafa , 2012 the transformation of modernity to globalization, University office, P. 29
19. 25. Franchetti, M. J., and Apol, D. (2012). Carbon footprint analysis: concepts,
20. Methods, implementation and case studies. CRC Press.
21. 26. Mohammed, M. U. F., & My thanks go to

Fawzi. (2017). The role of sustainable accounting in improving the information content of financial reports. Accounting thought, 21 (3), 61-124.

22. 27. Sami Salem Al-hassadi. (2018). Enhancing the role of accounting in supporting sustainable development goals. Scientific journal of Benghazi university, 31 (1), 34-34.
23. 28. Wet, C. A. E., & Jamal Mr. Ibrahim. (2023). The role of sustainable accounting in the development of the information content of financial reports in the therapeutic entities of the comprehensive health insurance system in Egypt. Scientific journal of financial and commercial studies and research, 4(2), 1259-1301.
24. 29. Chaltiger-S. - Porritt, R. L. (2010). "Corporate Sustainability Accounting: motto or decision support for business leaders?". Global Business Journal. C. 45 p. 4: 375–384. DOI: 10.1016 / y.GOP.2009.08.002.
25. 30. M. M. (1997). "Twenty-five years of social and environmental accounting research. Is there a silver jubilee to celebrate?". Journal of accounting, auditing and accountability. C. 10 p. 4: 481–531. DOI: 10.1108 / day0000000004417.
26. 31. K, P. / De Haan, M. """,,, Http://www.cbs.nl/nr/rdonlyres/7e93afcb-b0c3-497f-be70-661a59d168bc/0/accountingforsustainabledevelopment.pdf 9 9 2 2017.., Retrieved: 30.03.2012
27. 32. Association of Certified Public Accountants (2002). """, Http://wedocs.unep.org/bitstream/handle/20.500.11822/8238/-Industry%20as%20a%20Partner%20for%20Sustainable%20Development%20_%20Accounting-2002116.pdf?sequence=3&isAllowed=y,:: 30.03.2012 2 22 2 2021..
28. 33. Tilt, CA (2007). "Corporate responsibility accounting and accountants". Idowu,Samuel O. Lil Filho, Walter (eds.), Professional perspectives of Corporate Social Responsibility, DOI 10.1007 / 978-3-642-02630-0_2, Springer Verlag Berlin Heidelberg 2009.
29. 34. Perini-Francesco-tencati-Antonio(2006 dollars). "Sustainability and stakeholder management: the need for new systems for corporate performance evaluation and reporting". Business and environmental strategy. C. 15 p. 5: 296–308. DOI: 10.1002 / mad cow disease.538.
30. 35. Retrieved: 20.03.2012". Ifac.org. 2 2024 - 27-2. View it on 2013-09-24.
31. 36. Properties, a. M. G. P., Ahmed Mohamed Zakaria Adly, Khalifa, Mohamed Abdel Aziz, Salam, & Salah Hassan. (2019). A proposed model for increasing the credibility of the reports of one of the regulatory bodies on the environmental performance of organizations. Journal of Environmental Sciences, 45(2), 303-339.
32. 37. Muhammad Qais Adel al-Qanbari, & Muhammad Qais Adel al-Qanbari. (2021). Skills required to achieve the Sustainable Development Goals in the Libyan accounting environment: an exploratory theoretical study.
33. 38. Mohamed Sherif Abdeslam, a., & Farghali Ali Mahmoud, e. (2023). Global environmental citizenship among university students in the light of the national strategy for climate change in Egypt 2050 field study at Assiut University. Journal of the Faculty of Education (Assiut), 39(12), 1-126.
34. 39. Dickey d, Fuller W (1981) probability ratio statistics for automatic regressive time series with unit root. Econometrica 49(4):1057-1072
35. 40. Druze S., Savin I, Berg J., Villamayor Thomas S. (2022) climate anxiety and policy acceptance before and after covid-19. Ecol Eikon 199: 107507. https://doi.org/10.1016/j.ecolecon.2022.107507