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Corporate Social Responsibility Governance and Its Impact on Reducing the Carbon Footprint: An Analytical Study of the Opinions of a Sample of Employees at Al-Waha Food Industries Ltd.

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Abstract : This study aims to investigate the role of corporate social responsibility (CSR) governance in reducing the carbon footprint of organizations. In an era of increasing environmental concerns and climate change, companies face growing pressure to adopt sustainable practices. This study explores the relationship between CSR governance structures and the implementation of strategies to reduce carbon emissions, considering various aspects such as organizational policies, stakeholder engagement, and the integration of eco-friendly technologies. Through a comprehensive analysis of existing literature, case studies, and empirical data, the study seeks to provide insights into the effectiveness of CSR governance in promoting a more sustainable business environment.

To achieve the study's objectives, researchers distributed 150 questionnaires to employees at Al-Waha Food Industries Ltd. A total of 135 questionnaires were returned, of which 112 were valid for statistical analysis. The data were analyzed using the advanced statistical program SmartPLS V.4. The study concluded with several key findings, the most important being that CSR governance significantly influences the reduction of the carbon footprint. The effectiveness of CSR governance in reducing the carbon footprint likely depends on several factors, including corporate commitment, government support, stakeholder involvement, and the ability to overcome industry-specific challenges.

Keywords: CSR governance, carbon footprint reduction, Al-Waha Food Industries Ltd.

Introduction:

In the contemporary global landscape, environmental sustainability has gained paramount importance. As nations grapple with the challenges posed by climate change, there is a growing recognition of the role that corporations play in either contributing to or mitigating harmful environmental impacts. Corporate social responsibility (CSR) has emerged as a pivotal framework through which companies can actively engage in sustainable practices, and CSR governance has become crucial in ensuring the effective implementation of such initiatives.

Iraq, a country with a rich cultural and historical heritage, faces its own set of challenges, including environmental concerns such as a significant carbon footprint. The harmful effects of carbon emissions on climate change, coupled with the need for responsible business practices, have prompted a closer examination of the role CSR governance can play in reducing the carbon footprint within the Iraqi context.

The aim is to study CSR governance and its impact on reducing the carbon footprint in Iraq by providing insights into fostering a sustainable and responsible business environment. By encouraging companies to integrate CSR principles into their core strategies, Iraq can make substantial progress in mitigating carbon emissions, contributing not only to global environmental goals but also ensuring a more sustainable and prosperous future for its citizens.

Chapter One Methodological Framework of the Study

First: The Problem of the Study

In September 2015, the United Nations General Assembly convened as part of its seventieth session and adopted the Sustainable Development Goals (SDGs). These goals aim to develop a global sustainability agenda "of the people, by the people, for the people," aligning with the active presence of the United Nations Educational, Scientific and Cultural Organization (UNESCO). The core of these goals is a global agreement designed to address poverty, protect the planet through various sustainable means, and ensure the well-being of populations. The SDGs integrate three pillars of sustainable development: economic, environmental, and social development. The United Nations' SDGs form the 2030 Agenda for Sustainable Development, adopted by 193 countries, as they address broader issues than the previous Millennium Development Goals (MDGs). The SDGs encourage a shift in focus for developing nations towards sustainable development for all countries. This shift emphasizes the sustainability of the global economy and social development worldwide while protecting the global environment (Saeed, et al. 2021: 37).

Countries around the world face the interconnection between economic and environmental sustainability and have no choice but to balance economic growth with addressing climate changes. There is increasing scientific evidence that

climate changes tend to hinder the achievement of economic development goals globally. Furthermore, climate change has both economic and environmental costs associated with the carbon footprint at almost all levels in a country, from national to individual. This provides a rationale for the United Nations Framework Convention on Climate Change (UNFCCC) to negotiate internationally on certain aspects of environmental development. The UNFCCC integrates the landmark 2016 Paris Agreement, which encompasses actions, investments, and other initiatives to combat climate change, with its primary consideration being long-term temperature goals to limit the temperature increase to below 2 degrees Celsius (Albert, 2022: 18).

The impact of a particular sector on the environment and society makes it crucial for sustainable development, with the energy sector being the most significant. The energy sector plays a vital role in sustainable environmental development, especially given the increasing trend towards the "development of the green economy." This trend aims to restructure economies in response to climate changes and enhance sustainability efforts.

Section One : Methodological Framework of the Study

Second: Importance of the Study

1. Long-term Resilience: Building a sustainable future requires collective action. By prioritizing carbon reduction, organizations contribute to creating a more resilient and equitable society for future generations. Understanding the importance of CSR governance in reducing the carbon footprint is crucial for several reasons:
2. Reducing Greenhouse Gas Emissions: Through the implementation of effective carbon reduction strategies, institutions can significantly mitigate climate change and its devastating consequences.
3. Resource Conservation: A lower carbon footprint often translates to reduced energy consumption, water usage, and waste generation, enhancing resource efficiency and environmental sustainability.
4. Protecting Biodiversity: Reducing environmental impact through carbon reduction helps protect ecosystems and biodiversity, safeguarding vital natural resources.
5. Enhancing Brand Reputation: Consumers increasingly demand sustainable practices from companies. Demonstrating a commitment to carbon reduction can enhance brand image and attract environmentally conscious customers and investors.
6. Cost Savings: Implementing energy efficiency practices and reducing resource consumption can lead to significant cost savings for institutions.
7. Operational Efficiency: Streamlining processes and improving resource utilization often accompany carbon reduction efforts, enhancing operational efficiency and productivity.
8. Employee Engagement: Employees are more likely to be motivated and engaged when working for companies committed to social responsibility and environmental sustainability.
9. Community Development: Companies can contribute to the well-being of communities by reducing their environmental impact and supporting local sustainability initiatives.

Third: Objectives of the Study

This study aims to achieve the following objectives:

1. Assess the impact of CSR governance on reducing the carbon footprint.
2. Provide recommendations to enhance CSR governance strategies.
3. Offer practical recommendations for organizations to strengthen CSR governance frameworks.
4. Suggest strategies to promote a culture of sustainability within the corporate sector.

Fourth: Operational Definitions

The current study aims to test the relationship between two variables:

Independent Variable: Corporate Social Responsibility Governance. This refers to the framework and processes used by companies to manage their CSR activities and ensure alignment with their overall strategy and long-term goals (Beddewela & Cowton, 2020).

Dependent Variable: Carbon Footprint. This is a measure of the total amount of greenhouse gases, specifically carbon dioxide (CO2) and other carbon compounds, emitted directly or indirectly by an individual, company, event, or

product throughout its lifecycle. It is usually expressed in metric tons of CO2 equivalent to account for the varying global warming potential of different greenhouse gases (Saeed et al., 2021).

Fifth: Hypotheses of the Study

The current study is based on two main hypotheses as follows:

Main Hypothesis 1: There is a statistically significant correlation between CSR governance and carbon footprint reduction. This hypothesis branches into several sub-hypotheses:

1- There is a statistically significant correlation between board oversight and carbon footprint reduction.
2- There is a statistically significant correlation between CSR policies and strategies and carbon footprint reduction.
3- There is a statistically significant correlation between stakeholder engagement and carbon footprint reduction.
4- There is a statistically significant correlation between performance measurement and reporting and carbon footprint reduction.

Main Hypothesis 2: There is a statistically significant impact of CSR governance on carbon footprint reduction. This hypothesis branches into several sub-hypotheses:

- There is a statistically significant impact of board oversight on carbon footprint reduction.
- There is a statistically significant impact of CSR policies and strategies on carbon footprint reduction.
- There is a statistically significant impact of stakeholder engagement on carbon footprint reduction.
- There is a statistically significant impact of performance measurement and reporting on carbon footprint reduction.

Sixth: The Hypothetical Framework of the Study and Its Measures

The hypothetical framework and measures of the study will be outlined to systematically test the relationships and impacts defined in the hypotheses. The framework will integrate the independent variable (CSR governance) and the dependent variable (carbon footprint reduction) and examine their correlations and impacts through the specified sub-hypotheses. This will involve using statistical tools and methodologies to analyze the data collected from the sample, ensuring a rigorous examination of the proposed hypotheses.

The current study model consists of two variables:

1. Independent Variable: Corporate Social Responsibility Governance, measured based on the scales by Li et al. (2015) and Beddewela & Cowton (2020).
2. Dependent Variable: Carbon Footprint, measured based on the scale by Saeed et al. (2021).

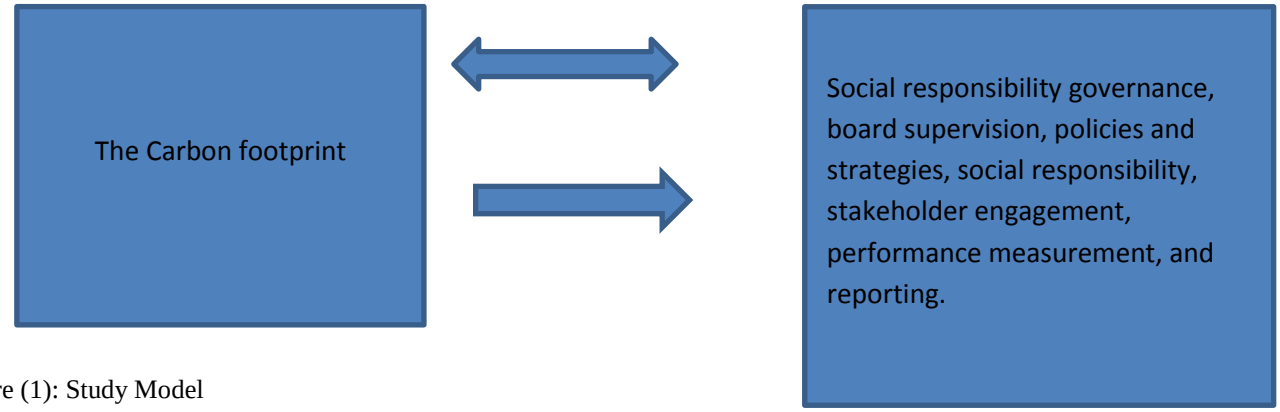


Figure (1): Study Model

Seventh: Study Methodology

The current study relies on the descriptive-analytical method due to its suitability for the nature and objectives of the study and its ability to answer the study questions and objectives. This method aims to describe the phenomenon under study, analyze its data, and interpret the causal relationships between its components more realistically. It allows the researcher to describe phenomena more accurately by moving from the specific to the general.

Eighth: Study Boundaries

The scope of the study consists of the following boundaries:

1. Spatial Boundaries: The study is geographically limited to Al-Waha Company for Food

● Temporal Boundaries: The study was conducted from October 16, 2023, to January 15, 2024. This period included gathering information for the theoretical part, distributing and collecting questionnaires, and performing statistical data analysis.

2. ● Human Boundaries: The human boundaries of the study are represented by the employees of Al-Waha Company.

3. ● Subject Boundaries: The subject boundaries of the study focus on crucial and important variables in the field of business management, namely CSR governance and carbon footprint reduction. Additionally, the study examines methods for testing the nature of the relationship between the study variables.

4. Ninth: Methods Used in Analyzing the Practical Aspect

5. To achieve the required results from the study and verify the relationships in the hypotheses, as well as to accomplish the study's objectives, the pre-packaged software (SmartPLS V.4) was tested as the main tool for statistical analysis. The following statistical methods were used in analyzing the study data:

6. Descriptive Analysis Methods: These include frequencies and percentages to describe the sample of respondents, arithmetic means as a measure of central tendency, and standard deviations as a measure of data dispersion.

7. Structural Model Evaluation and Hypothesis Testing Methods: These involve Partial Least Squares Structural Equation Modeling (PLS-SEM) criteria, including four key standards:

8. Standardized Root Mean Square Residual (SRMR)
9. Collinearity Assessment
10. Path Coefficient Method
11. Determination R^2 Coefficient
12. Effect Size (f^2) Criterion.
13. Industries.

Section Two: Theoretical Framework of the Study

First Topic: Theoretical Framework of Corporate Social Responsibility Governance

First: The Concept of Corporate Social Responsibility Governance

Corporate social responsibility (CSR) has been at the forefront of academic discussions for over half a century. The essence of CSR lies in the commitment of companies not only to act ethically towards various stakeholders, including society as a whole, but also to ensure sustainable economic progress. CSR governance consists of "specific actions and processes that govern the performance of companies in areas such as human rights, labor standards, environmental practices, anti-corruption activities, responsible investment, stakeholder engagement, and responsible supply chain management." The institutional integration of these issues requires that CSR governance is inherently linked to the expectations of external stakeholders, including national and regional governments, non-governmental organizations, supranational organizations, and a range of other stakeholders (Beddewela & Cowton, 2020: 337).

CSR governance refers to the vertical integration and control of the CSR strategy within the company, such that "elements of the organizational strategy cascade down to all levels, thereby creating alignment between organizational goals, objectives, and processes" (Lock & Seele, 2016: 6).

CSR governance also refers to the frameworks, processes, and structures that companies use to manage their CSR activities and ensure their alignment with the company's overall strategy and values. Essentially, it is how a company ensures that its social responsibility efforts are effective and impactful (Sarkar & Pingle, 2018: 4).

Additionally, CSR governance involves the structures, processes, and mechanisms that institutions establish to manage and implement CSR initiatives effectively. CSR entails the company's commitment to acting ethically, contributing to economic development, improving the quality of life for employees and their families, and positively

impacting local communities and society at large. Governance in the context of CSR ensures that these commitments are integrated into the company's overall strategy and operations (Lajmi, 2020: 61).

The governance aspect of CSR refers to the systems, processes, and structures implemented by a company to ensure that its CSR commitments are effectively translated into actions (Kusumaningtyas et al., 2021: 2).

According to Zainal & Zeriand (2022: 766), CSR governance is an institutional social program aimed at providing assistance and empowering communities surrounding the company as a form of social responsibility or compensation for various losses the community might incur due to the company's operations.

From the above, it can be concluded that CSR governance is one of the commitments that a company must undertake.

Second: The Importance of Corporate Social Responsibility Governance

CSR governance is critical for companies as it involves integrating ethical, social, and environmental considerations into decision-making processes and operations. The importance of CSR governance can be highlighted in several ways as follows (Zainal & Zeriand, 2022: 769):

1- Building a Positive Reputation: CSR governance helps build a positive reputation and enhance the company's brand image. Consumers are increasingly aware of social and environmental issues and often prefer to support companies that demonstrate a commitment to responsible practices.

2- Fostering Trust: Effective CSR governance fosters trust among various stakeholders, including customers, employees, investors, and the community. When a company engages in socially responsible activities and communicates its efforts transparently, it is more likely to gain the trust and loyalty of stakeholders.

3- Risk Mitigation: CSR governance contributes to risk mitigation by identifying and addressing social and environmental risks associated with the company's operations. This proactive approach helps companies avoid potential legal, financial, and reputational challenges.

4- Attracting and Retaining Talent: Employees increasingly value socially responsible employers. Companies with strong CSR governance are better positioned to attract and retain top talent. Employees often feel more engaged and motivated when working for an organization committed to making a positive impact.

5- Operational Efficiency and Cost Savings: CSR governance can lead to operational efficiency and cost savings. For instance, implementing environmentally sustainable practices can reduce resource consumption and waste, ultimately benefiting the company's bottom line.

6- Competitive Advantage: Many consumers actively seek products and services from companies with a clear commitment to CSR. In competitive markets, a strong CSR governance framework can provide a competitive advantage and distinguish the company from its peers.

7- Regulatory Compliance: CSR governance ensures the company adheres to relevant laws and regulations concerning social and environmental issues. Proactively meeting regulatory requirements helps companies avoid legal problems and potential financial penalties.

8- Long-term Sustainability: By integrating CSR into their governance structures, companies contribute to long-term sustainability, not just for themselves but also for the broader society and the planet. This perspective aligns with the growing recognition of the interconnectedness of business success and societal well-being.

CSR governance is essential for the overall success and sustainability of businesses. It goes beyond financial performance and contributes to building a resilient, responsible, and trustworthy company, well-positioned for long-term success in an ever-changing global landscape.

Third: Dimensions of Corporate Social Responsibility Governance

[To be continued based on the specific dimensions and further details provided in the study.]

Second Topic: Carbon Footprint Reduction

First: Concept of Carbon Footprint Reducing carbon impact is of paramount importance in mitigating climate change. Individuals and organizations can take steps to diminish their impact, such as adopting energy-efficient practices, utilizing renewable energy sources, minimizing waste, and making sustainable choices in transportation and consumption. Additionally, carbon offset initiatives, like tree planting or investing in renewable energy projects, can help balance unavoidable emissions (Ghosh, et al, 2020: 125).

According to Şöhret & Karakoç (2016: 125), the carbon footprint is defined as "the total aggregate of greenhouse gas emissions resulting from a company, event, product, or individual, serving as a useful metric for understanding the contribution to climate change." It is often measured in units of carbon dioxide equivalents (CO2e) to account for the differing global warming potentials of various greenhouse gases. The carbon footprint includes both direct emissions, resulting from activities such as burning fossil fuels for energy, and indirect emissions, resulting from the production and consumption of goods and services. Carbon footprint (CF) is generally adopted as an indicator for measuring carbon dioxide (CO2) emissions or greenhouse gas (GHG) emissions in terms of carbon dioxide equivalents (CO2-eq) (Chen, et al, 2021: 1).

Additionally, the carbon footprint represents a measure of total greenhouse gas emissions, expressed in carbon dioxide equivalents (CO2e), directly or indirectly associated with an individual, company, event, or product. It serves as a method to measure the human activities' impact on the environment in terms of their contribution to climate change (Valls-Val, & Bovea, 2022: 793).

Moreover, the carbon footprint refers to the quantity of greenhouse gases (including carbon dioxide and methane) produced by various processes, products, and services (Campos, et al, 2022: 18). From the aforementioned, the carbon footprint can be defined as "a measure of the total quantity of greenhouse gases (primarily carbon dioxide, but also methane, nitrous oxide, and others) released into the atmosphere as a result of individual and corporate activities. This includes direct emissions from things like driving a car or using electricity, as well as indirect emissions from the production and consumption of goods and services."

Second: Sources of Carbon Footprint Below are some common sources contributing to the carbon footprint for individuals or companies (Ghosh, et al, 2020: 127):

1- Energy Use: Burning fossil fuels for electricity and heat generation is a major contributor. This includes energy used in households, businesses, and transportation.

2- Transportation: Emissions from cars, trucks, airplanes, and other forms of transportation significantly contribute to carbon impacts.

3- Food Production and Consumption: The production, transportation, and processing of food contribute to the carbon footprint. Some foods, especially those with long supply chains or produced using energy-intensive methods, have higher carbon impacts.

4- Waste Generation: Organic waste decomposition in landfills produces methane, a potent greenhouse gas. Additionally, the production and disposal of goods contribute to the carbon footprint.

5- Industrial Processes: Manufacturing and other industrial activities can release large quantities of greenhouse gases.

Third: Importance of Carbon Footprint Reduction

Third: Importance of Carbon Footprint Reduction

Reducing the carbon footprint is of utmost importance for several reasons, primarily concerning environmental, economic, and social aspects. Below are some key reasons that highlight the importance of reducing the carbon footprint (Saeed, et al, 2021: 3):

1- Greenhouse gas emissions, especially carbon dioxide, contribute to the phenomenon of global warming, leading to climate change. By mitigating the effects of carbon, we can help alleviate the adverse impacts of climate change, such as rising temperatures, extreme weather events, and sea-level rise.

2- High carbon emissions are often linked to fossil fuel extraction and combustion, deforestation, and industrial processes. These activities contribute to air and water pollution, soil degradation, and loss of biodiversity. Reducing the carbon footprint helps protect ecosystems and preserve natural resources.

3- Many initiatives aimed at reducing the carbon footprint involve adopting energy-efficient technologies and practices. This not only helps in emission reduction but also promotes sustainable energy sources, leading to a more resilient and reliable energy infrastructure.

4- Air pollution, a secondary consequence of many carbon-intensive activities, can have serious health effects. By reducing carbon emissions, we can improve air quality, leading to enhanced respiratory health and a decrease in respiratory diseases among populations.

5- Fossil fuel extraction and combustion contribute to resource depletion. By transitioning to renewable energy sources and sustainable practices, we can alleviate pressure on limited resources and ensure their availability for future generations.
6- Transitioning to a low-carbon economy offers economic opportunities in the form of green jobs, innovation, and sustainable business practices. Investment in renewable energy, energy-saving technologies, and environmentally friendly practices can stimulate economic growth and create new markets.
7- Climate change is a global issue that requires international cooperation. By taking steps to reduce carbon emissions, countries can contribute to global efforts aimed at achieving climate goals outlined in agreements such as the Paris Agreement, enhancing international cooperation and solidarity.
8- Climate change exacerbates the frequency and intensity of natural disasters. By reducing carbon emissions, we can contribute to building more resilient communities better equipped to withstand the impacts of severe weather events.
9- Many companies recognize the importance of corporate social responsibility and sustainable practices. Adopting measures to reduce the carbon footprint enhances the company's reputation, attracts environmentally conscious consumers, and may lead to long-term cost savings.
10-As stewards of the planet, individuals, companies, and governments have an ethical responsibility to protect the environment for current and future generations. Taking necessary actions to reduce the effects of carbon reflects a commitment to sustainable and responsible behavior.
Reducing the carbon footprint is vital for addressing climate change, protecting the environment, promoting sustainable development, and ensuring the well-being of current and future generations.

Topic Three Practical Application of the Study First Section Overview of the Company Under Study

Al Wahah Company is one of the industrial investment projects that has contributed to supporting the economic aspect in the country by meeting the market demand in Babylon and other provinces of Iraq with its products and by bringing hard currency into the country through exporting its products to other countries. The project's cost is estimated at 10 million dollars, and it provides approximately 900 job opportunities. It was established on private land for the investing company. Additionally, it contributes to achieving benefits for the community through their initiative to establish a desalination water station serving the residents of the area where the factory is located. Moreover, it provides other significant benefits supporting the health sector, particularly in combating the COVID-19 pandemic. The investing company distributed 480 tons of oxygen to health institutions in Babylon.

Second Section Descriptive Analysis of Study Variables

Independent Variable: The reduction of carbon footprint is crucial for addressing climate change, protecting the environment, promoting sustainable development, and ensuring the well-being of current and future generations.

Table (1) presents the descriptive statistics for the study variables using the weighted arithmetic mean as a measure of central tendency and the standard deviation as a measure of data dispersion. The results of the weighted arithmetic mean indicate that all items of the corporate social responsibility governance variable exceeded the hypothetical mean of (3) (when using the Likert five-point scale). This suggests that all items and the overall variable are prevalent in the studied company but below the required level. Similarly, the items of the dependent variable, carbon footprint reduction, were higher than the hypothetical mean, indicating their prevalence in the researched company but below the required level. Additionally, the descriptive analysis results showed low percentages of standard deviation and variance, indicating the accuracy of respondents' answers and their understanding of the items.

Table (1): Descriptive Statistics for Study Variables

Variable	Dimension	Items	Mean	Standard Deviation	Variance
Corporate Social Responsibility Governance					
Board Oversight	X1-1	3.393	1.43521	2.060	
	X1-2	3.284	1.54509	2.387	
	X1-3	3.276	1.45490	2.117	
Policies and Strategies	X2-1	3.168	1.48086	2.193	

Variable	Dimension	Items	Mean	Standard Deviation	Variance
	X2-2	3.353	1.66893	2.785	
	X2-3	3.365385	1.56418	2.447	
Stakeholder Engagement	X3-1	3.19231	1.59923	2.558	
	X3-2	3.25	1.48086	2.193	
	X3-3	3.257692	1.52172	2.316	
Performance Measurement and Reporting	X4-1	3.269231	1.5858	2.5203	
	X4-2	3.153846	1.4627	2.1521	
	X4-3	3.119231	1.29958	1.689	
Carbon Footprint Reduction					
Y1	3.211538	1.68569	2.842		
Y2	3.103846	1.70369	2.903		
Y3	3.433	1.39514	1.946		
Y4	3.174	1.50211	2.256		
Y5	3.317	1.54509	2.387		
Y6	3.487	1.4627	2.1521		
Y7	3.607	1.66893	2.785		
Y8	3.213	1.5858	2.5203		
Y9	3.432	1.52172	2.316		
Y10	3.25	1.48086	2.193		

Source: Compiled by the researcher based on the outputs of SmartPLS V.4 program.

Section Three: Structural Model Evaluation and Hypotheses Testing

In this section of the study, researchers aim to test the hypotheses included in the current study, which relate to the correlation, direct, and indirect effects on the level of main variables and their sub-dimensions. A set of analytical methods is used to conduct the hypothesis testing.

First: Testing Correlation Relationships

This section includes testing the first main hypothesis, which suggests a positive and significant correlation between corporate social responsibility governance and carbon footprint reduction. Through Table (2) related to the correlation matrix, there is evidence of a significant and positive correlation between corporate social responsibility governance and carbon footprint reduction, with a correlation coefficient of (.821) at a significance level of (0.01). This result supports the validity of the first main hypothesis and rejects the alternative hypothesis.

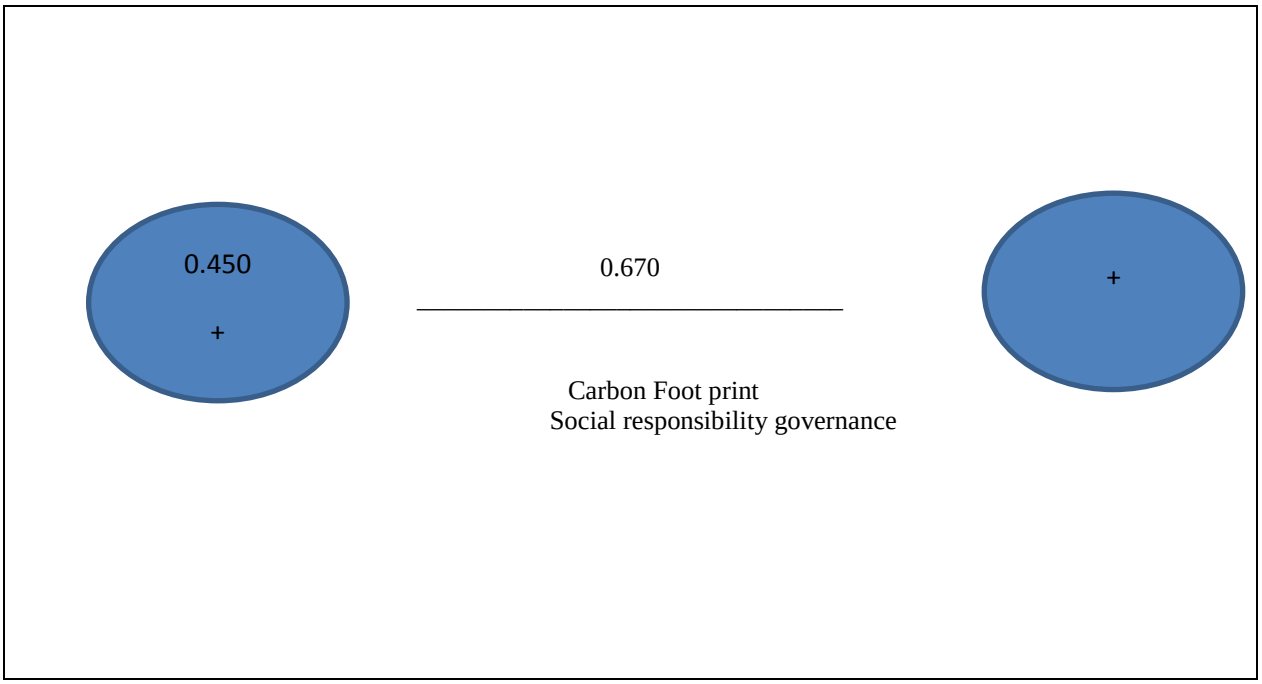
This hypothesis branched into four sub-hypotheses, including:

1) The presence of a positive and significant correlation between board of directors oversight and carbon footprint reduction.

Table (2), related to the correlation matrix, shows a significant and positive correlation between board of directors oversight and carbon footprint reduction, with a correlation coefficient of (-.633) at a significance level of (1%). This supports the validity of the first sub-hypothesis and rejects the null hypothesis.

2) There is a significant and positive correlation between corporate social responsibility policies and strategies and carbon footprint reduction.

Table (2) related to the correlation matrix shows a significant positive correlation between corporate social responsibility (CSR) policies and strategies and carbon footprint reduction. The correlation coefficient between them was (.632-) at a significance level of (0.01), supporting the validity of the second sub-hypothesis and rejecting the null hypothesis.



3. There is a significant positive correlation between stakeholder engagement and carbon footprint reduction. Table (2) indicates a significant positive correlation coefficient of (.648-) at a significance level of (0.01), supporting the validity of the third sub-hypothesis and rejecting the null hypothesis.
4. There is a significant positive correlation between performance measurement and reporting and carbon footprint reduction. Table (2) demonstrates a significant correlation coefficient of (.611-) at a significance level of (0.01), supporting the validity of the fourth sub-hypothesis and rejecting the null hypothesis.

Table (2) - Correlation Matrix between Corporate Social Responsibility Governance and Its Dimensions with Carbon Footprint Reduction

	X	X1	X2	X3	X4
Y	Pearson Correlation	-.821**	-.633**	-.632**	-.648**
	Sig. (2-tailed)	.000	.000	.000	.000
	N	112	112	112	112

Source: SPSS v.26 Results.

- Impact Hypotheses (The Second Main Hypothesis)

The verification process of impact hypotheses, the direct impact among the variables of the current study according to the respondents' opinions, will be conducted through building the Structural Equations Modeling (SEM) model, as depicted in
Figure (2).

Firstly: Testing the Second Main Hypothesis

The second main hypothesis (H2) states that "there is an impact relationship between corporate social responsibility governance and carbon footprint reduction." To test this hypothesis, the structural model depicted in Figure (2) has been constructed, and its results are presented in Table (3).

Table (3) presents the results of evaluating the structural model related to the second main hypothesis. Hypothesis Path Path Coefficient t Value p Value Result R-squared (R2) Adjusted R-squared (R2) H2 X→Y -0.670 12.702 0.000 Acceptance 0.45 0.38 Source: Outputs of SmartPLs V.4 software. Table (3) reviews the evaluation results of the structural model related to the third main hypothesis, which showed that the path coefficient for this hypothesis was 0.670 (which meets the required thresholds for both T-value and P-value). For explanatory purposes, the adjusted R-squared coefficient (R2) was 0.45, indicating that the variable of corporate social responsibility governance explains 45% of the variance in carbon footprint, with the remaining percentage being attributed to other factors not addressed

by the model. Secondly, testing the sub-hypotheses derived from the second main hypothesis. The sub-hypotheses derived from the second main hypothesis (H2-1, H2-2, H2-3, H2-4) are as follows: H2-1: There exists a positive relationship between board supervision and reducing carbon footprint.
H2-2: There is a positive relationship between corporate social responsibility policies and strategies and reducing carbon footprint.
H2-3: There is a positive relationship between stakeholder engagement and reducing carbon footprint.
H2-4: There is a strong relationship between performance measurement and reporting and reducing carbon footprint.
For the purpose of testing these hypotheses, a structural model was constructed as shown in Figure (3), and Table (4) presents the results of evaluating the structural model for these hypotheses.

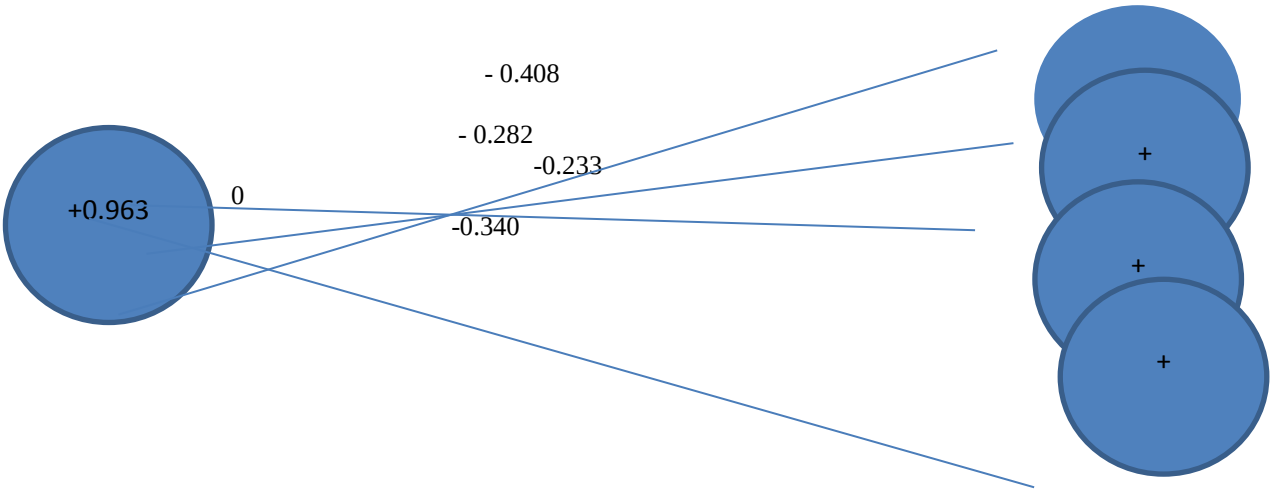


Table (4) Results of evaluating the structural model for the sub-hypotheses derived from the second main hypothesis

R^2Adjusted	R^2	Result	p Value	t Value	Path Coefficient	Path	Hypothesis
0.858	0.963	Accept	0.000	7.131	- 0.408	X1→Y	H3-1
		Accept	0.000	5.629	- 0.282	X2→ Y	H3-2
		Accept	0.000	4.115	- 0.233	X3→ Y	H3-3
		Accept	0.000	6.975	- 0.340	X4→ Y	H3-4

Source: output of SmartPLs V.4
Table (4) presents the results of evaluating the structural model for the sub-hypotheses derived from the second main hypothesis. It indicates that all path coefficients for the three hypotheses (H2-1, H2-2, H2-3, H2-4) are significant, meeting the required thresholds for both T-value and P-value. For explanatory purposes, the adjusted R-squared coefficient (R2) was 0.963, suggesting that the dimensions of corporate social responsibility governance explain 96% of the variance in carbon footprint, with the remaining percentage attributed to other unaddressed factors.
Axis IV: Conclusions, Recommendations, and Suggestions

Firstly: Conclusions The conclusions drawn from the study are as follows:

- Gathering accurate data on the impact of corporate social responsibility governance on reducing carbon footprint in Iraq is challenging due to potential constraints on data. Standards of transparency and reporting related to corporate social responsibility practices vary, making it difficult to assess effectiveness comprehensively.

• Successful corporate social responsibility governance includes active engagement with various stakeholders, including communities, non-governmental organizations, and governmental bodies. The failure of companies in Iraq to engage these stakeholders in decision-making processes and integrate their perspectives can enhance the effectiveness of corporate social responsibility initiatives in addressing environmental concerns.

1.

Given the global nature of environmental challenges, international cooperation and adherence to global standards can play a crucial role. Companies in Iraq aligning their corporate social responsibility initiatives with international best practices can contribute more effectively to global efforts to reduce carbon footprint.

2. Corporate social responsibility governance influences the reduction of carbon footprint, and the effectiveness of corporate social responsibility governance in reducing carbon footprint is likely to depend on a variety of factors, including corporate commitment, government support, stakeholder engagement, and the ability to overcome industry-specific challenges. Continuous monitoring, evaluation, and adaptation of corporate social responsibility strategies are necessary to achieve meaningful and sustainable environmental outcomes.

Secondly: Recommendations Effective implementation of corporate social responsibility governance can have a positive impact on reducing carbon footprint in the Iraqi context. Here are some recommendations for integrating corporate social responsibility governance to address environmental sustainability and reduce carbon footprint:

1) Clearly articulate a corporate social responsibility policy that explicitly outlines the company's commitment to environmental sustainability, including goals and objectives for reducing carbon emissions.

2) Conduct regular environmental impact assessments to identify and analyze the company's carbon footprint. This will provide a baseline for setting reduction targets and implementing effective strategies.

3) Explore investment opportunities in renewable energy sources and their utilization. This may involve integrating solar or wind energy systems into operations to reduce reliance on carbon-intensive traditional energy sources, as well as implementing waste management practices that prioritize recycling and waste reduction. Implementing a comprehensive recycling program can significantly contribute to reducing the overall carbon footprint.

4) Educate employees about the importance of environmental sustainability and provide training on practices that can reduce the company's carbon footprint. Encourage employee participation through green initiatives and recognition programs.

Through integrating these recommendations into corporate social responsibility practices, companies in Iraq can contribute to reducing carbon footprint, demonstrating environmental responsibility, and positively impacting the communities in which they operate.

Third: Proposed Strategies for Reducing Carbon Footprint through Corporate Social Responsibility Governance

Corporate social responsibility governance plays a crucial role in influencing and driving initiatives aimed at reducing carbon footprint in any region, including the Iraqi context. The following are several ways through which effective corporate social responsibility governance can contribute to reducing carbon footprint in Iraq:

1. Corporate Policies Development: Corporate social responsibility governance can involve the development and implementation of policies that encourage companies to adopt environmentally friendly practices. This may include setting carbon reduction targets, adopting renewable energy sources, and enhancing sustainable business operations.

2. Engagement with Stakeholders: Dealing with various stakeholders, including government entities, local communities, and environmental organizations, is essential. Corporate social responsibility governance can facilitate collaboration and partnerships to collectively address carbon reduction challenges. Stakeholder inputs can also ensure that initiatives are culturally and socially relevant.

3. Effective Management: Effective corporate social responsibility management requires transparency and accountability. Companies can be encouraged to disclose their carbon emissions and reduction efforts through standardized reporting frameworks. This transparency allows stakeholders to assess the impact of corporate activities on the environment.

4. Investment in Clean Technologies: Corporate social responsibility governance can guide companies towards investing in and adopting clean technologies. This may include funding research and development for sustainable practices, energy-efficient technologies, and renewable energy sources.
5. Employee Awareness and Engagement: Corporate social responsibility governance can promote employee awareness programs and engagement to encourage environmentally responsible behavior within organizations. This may involve training programs, workshops, and incentives to reduce energy consumption and waste generation.

6. Companies often have extensive supply chains that contribute to their carbon footprint. Corporate social responsibility (CSR) governance can focus on ensuring that suppliers adhere to sustainable practices, thereby reducing the overall environmental impact of the entire value chain.

7. CSR initiatives can extend beyond corporate boundaries to support local communities in adopting sustainable practices. This might include investing in community projects such as reforestation, waste management, and renewable energy projects.

8. CSR governance ensures that companies comply with environmental regulations and standards set by the government. It can also advocate for stronger environmental policies that help reduce carbon impacts at both the industry and national levels.

9. Encouraging innovation and research in green technologies and sustainable business practices is a key aspect of CSR governance. This can lead to the development of new solutions to reduce carbon impacts across various industries.

10. CSR governance involves the continuous monitoring and evaluation of the environmental impact of corporate activities. This enables companies to assess the effectiveness of their initiatives and make necessary adjustments to achieve better carbon reduction results.

11. In the Iraqi context, where environmental concerns are significant, effective CSR management can contribute to sustainable development and help mitigate the impact of industrial activities on the environment. Collaboration between the government, companies, and communities is essential for the success of CSR initiatives aimed at reducing the carbon footprint in Iraq.

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