DOI: 10.55643/fcaptp.5.58.2024.4506

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THE ROLE OF SUSTAINABILITY ACCOUNTING ON DECISION-MAKING: FIELD STUDY ON SUDANESE INDUSTRIAL COMPANIES

ABSTRACT

The article's goal is to explore how the economic, social, and environmental sustainability accounting components affect decision-making (DM) in the industrial sector of Sudan. This can assist companies in understanding and disclosing the benefits and drawbacks of their activities. The practical significance of scientific research is found in the way that the research conclusions will help to clarify sustainability-related concerns and reinforce Sudanese industrial businesses' dedication to them. Furthermore, there aren't many studies that address this subject in the context of Sudan.

The results of the research show that the economic dimension has a positive impact on decision-making in the Sudanese industrial sector. It was also found that the social dimension plays a part in DM. On the other hand, DM Sudanese industrial businesses lack an environmental dimension. According to the study's recommendations, accounting regulators must develop guidelines and frameworks to help accountants measure and disclose sustainability information. Future research should continue to examine the impacts of sustainability development issues on Sudanese manufacturing firms to raise awareness of sustainability issues among accountants and management.

Keywords: sustainability accounting, economic sustainability, social sustainability, environmental sustainability, decision-making, industry sector

JEL Classification: Q01, L00

INTRODUCTION

The U.N. directly led to the establishment of the Commission in 1992. Which work has gone toward creating and evaluating a set of indicators that span the institutional, social, environmental, and economic facets of sustainable development. These indicators are periodically evaluated and updated (Parris & Kates, 2003). The Millennium Declaration for the period 2000-2015 included the reduce severe hunger and poverty, making primary education accessible to all, and ensuring environmental sustainability(Nechita, 2019)**.** Next, established Sustainable Development Goals, which cover 17 areas are to end poverty, sustainable economic growth and preserve the environment (Blum et al., 2019)**.** The main goal of the SDGs is to enhance global corporate and government performance in the social, environmental, and economic domains. As a result, firms can use sustainability reports to advance the UN's agenda (Difalla & Belouadah, 2022).

Accounting that considers an organization's effects on the economy, society, and environment is known as sustainability accounting (SA). It comprises determining the organisation's internal and external sustainability performance, measuring it, and reporting on it. This alludes to the collection of techniques and instruments for the assessment, and the organization's management of the connection between non-financial and financial data Katsarski,2023). SA refers to the incorporation of economic, environmental, and social factors into the accounting system. Companies need to consider how their activities affect the environment and communities. When it comes to monitoring and reporting on resource usage, emissions, waste production, and CSR programs, accountants are essential. Businesses can make well-informed decisions that strike a balance between financial success and their social and environmental responsibilities (Wahyudi et al., 2024)**.** Accountants assist businesses in, fostering a healthy work environment,

Received: 30/07/2024
Accepted: 12/10/2024
Published: 31/10/2024

and matching their investment goals with sustainable ones by offering insightful analysis of the financial effects of sustainability efforts. Businesses contribute to a more sustainable and responsible future by adopting sustainability accounting(Tettamanzi et al., 2022).

Decision-making procedures should consider effects on the economy, society, and environment at the same time (Schaltegger et al., 2006). Developing and implementing novel techniques and best practices is necessary to make complex decision-making processes beyond the financial aspect by combining social and environmental considerations (Kandakoglu et al., 2019).

One country in East Africa that relies heavily on small-scale industry and traditional agriculture is Sudan. Following South Sudan's secession in July 2011, Sudan suffered economically due to the loss of substantial oil reserves (Hassabelgabo et al., 2020). Products that could be produced in industrial facilities included food and beverages, which made up around 55% of all manufacturing output. Large industries produce grain mills, textiles, sugar, and vegetable oil. Subsequently, it emerged that the oil, automotive, and heavy machinery industries could not satisfy the demands of the regional market (Musa & Ibrahim, 2023).

LITERATURE REVIEW

Sustainability Accounting (SA)

The term sustainability is defined as "an ongoing process that aims to achieve local and global improvements in the environment, economy, and society .To meet the demands of the current generation without jeopardizing the potential of the next generations. This approach ties the protection and augmentation of natural resources to the economic and social structures (Nocca, 2017). Or "Activities are humane, socially just, economically feasible, and ecologically sound, and they will remain so for future generations" (Clugston & Calder, 2000). Also a process of change that maximizes the capacity to satisfy both current and future human wants and ambitions by coordinating resource exploitation, investment direction, technology development orientation, and institutional changes (Nechita, 2019).

Meeting stakeholder expectations, controlling risks related to sustainability issues, and building long-term value for businesses all depend on SA. Businesses care about informing stakeholders and are committed to sustainability and transparency by taking into consideration their social and environmental implications (Tettamanzi et al., 2022). Accounting used to be thought of as a strictly technical profession. Over time, accounting is becoming increasingly seen as a social activity. Accounting used to be mostly concerned with a company's financial operations. But in today's world, accounting is becoming more concerned with how company operations affect society and the environment (Soares, 2022).

The phrase SA refers to modern accounting and information management techniques that seek to produce and deliver high-quality data to assist a business in moving toward sustainability (Schaltegger et al., 2006). By revealing non-financial facts about the company, SA is the area of accounting that compels companies to address environmental, social, and governance issues (Ozili, 2021). SA is a component of an organizational strategy that measures business performance and reports sustainability to enhance organizational performance. Because corporate sustainability is directly tied to a company's reputation, there is a growing trend towards its implementation. Managers of corporations take sustainability concerns into account when making strategic decisions(Kurniawan & Sawarjuwono, 2024). From goals of SA are Preparing reports on how organizations interact with society and the environment, and providing information for financial and non-financial, regarding an organization's social and environmental performance. Also, is to broaden the scope of traditional financial accounting to consider a variety of monetized data and non-financial (Ozili, 2021).

There are numerous benefits to disclosing SA information and reports a focus on how a company's financial and non-financial performance are integrated, readers of financial reports are aware of the risks and opportunities that businesses face, assessing sustainability performance, making it possible for external stakeholders to comprehend the real, increasing brand loyalty and repute (Difalla & Belouadah, 2022).

Economic sustainability (ES):

Economic development strategies aim to increase the standard of life on a worldwide scale. Following World War II, the United Nations, World Bank, and International Monetary Fund were founded as international institutions, initially concentrating on increasing industrial and agricultural production (Belouadah et al., 2023). This approach has focused on using economic expansion to reduce poverty. To help developing nations become more economically independent, foreign development organizations have supported several important infrastructure projects, including power plants, hydroelectric dams, roads, and industrial production growth (Fretheim et al., 2002). However, this strategy had negative effects like

DOI: 10.55643/fcaptp.5.58.2024.4506

deforestation, a decrease in arable land, and ecological damage. Also, intergenerational inequality is made worse when present generations are consuming resources. Meanwhile, there is an unequal distribution of wealth among the population (Malinić & Vučković-Milutinović, 2024). However, the focus switched in the 1980s to structural adjustment, which included economic deregulation, reducing public deficits, maintaining exchange rates, and dissolving inefficient parastatal organizations. These adjustments were intended to correct the errors created by earlier development initiatives, which resulted in excessive debt and unbalanced budgets (Belouadah et al., 2023).

The most fundamental performance required for a business to remain in operation is ES, which is the performance linked to raising earnings and cutting expenses (Yong-Ha & Young-Taek, 2020). ES system ought to be capable of constantly generating goods and services, managing capital effectively and using resources efficiently, ensuring that each person's basic needs and requirements are met, and raising standards of living by optimizing returns. (Yong-Ha & Young-Taek, 2020) Sustainability is becoming a standard corporate practice due to rising awareness of it. Businesses that take sustainability into account will use resources wisely to achieve social justice and efficiency. Businesses can operate in a way that takes sustainability into account(SETYAHADI & NARSA, 2020)**.**

Some believe that economic activity should not affect natural resources, and therefore the term natural capital was used, which became spread in 1990 and comprises entirely natural resources. It is typically separated into non-renewable resources, like mineral resources, and renewable resources, like food crops and water supplies (Jabareen, 2008). Data on physical changes in specific stocks, such as those resulting from depletion, and the ratio of nonrenewable stocks are used to calculate changes in the natural capital stock (Blum et al., 2019).

(Bolis et al., 2017) aim to understand how to support a more sustainable development model and the relationship between decision-making processes and economic sustainability. According to the findings, making sustainable decisions would necessitate education about values related to sustainability to impact individual choices, foster better teamwork during economic activities, and facilitate decision-making processes, which especially impact society and the environment.

(Kandakoglu et al., 2019) Explore making decisions by integrating social and environmental concerns with the economic dimension. The findings demonstrate that development aims to strike a balance between the short and long terms. However, long-term and unanticipated economic events are not considered in decision-making.

(Palm et al., 2021) focus on making resilient decisions for sustainability in the international fashion industry. The study found that policymakers are concerned about economic factors that reduce business risks and have negative environmental impacts.

(Tereshchenko et al., 2024) Examined the variables that affect and automate the process of determining a territorial community's economic potential. The findings showed that no decision support systems for evaluating the potential for economic growth of territorial communities had been created in Ukraine. Because the economic climate is highly unstable due to outside influences, manual evaluation of the findings may result in assessments that are not always accurate.

Based on the above, we can reach the following hypothesis:

H1. ES has a statistical influence on decision-making in Sudanese manufacturing firms.

Social sustainability (SS)

SS is an ethical standard of behaviour for the continued existence and development of humans. For example, human rights, diversity, charity, equity, health and safety, and poverty (Duong & Ha, 2021). Businesses' social responsibility initiatives are drawing increased attention from governments, suppliers, workers, investors, and consumers across the globe. Which mandated that businesses include social activity-related information in their yearly reports (Abdelraheem, 2024). Distributional justice, sufficient social service delivery, including health and education, and gender equity, are all necessary for the SS system to succeed (Gray et al., 2014). A tool for elucidating a business's social actions toward society and demonstrating its transparency is social disclosure. It functions as a medium for a business to communicate its social responsibility initiatives. Companies abide by their shareholders' demands and provide all relevant details regarding their SS in their yearly reports (Hussaien et al., 2021)**.**

Intergenerational and intragenerational equity are the two forms of equity in sustainability. The equitable distribution of resources between the present and future generations is referred to as intergenerational equity. Future possibilities for sustaining or raising living standards shouldn't be harmed by the decisions made today (Jabareen, 2008). Social sustainability (SS) suggests a social structure that works to reduce poverty. However, it denotes the connection between environmental degradation and social situations like poverty. According to the philosophy of social justice, economic growth should

be limited by social equality standards. To connect these, it is necessary to provide an enabling environment that promotes fair resource distribution, prioritizes resource allocation, and maximizes resource utilization (Fretheim et al., 2002).

(Anagnostopoulos et al., 2014) aims to investigate the decision-making procedure employed by English football clubs' charity foundations for CSR-related initiatives. The results show that decision-making involves several concurrent micro-social processes, which serve as the foundation for decision-making for the managers of the English football clubs' charity foundations**.**

(Mousiolis et al., 2015) aims to explore the effect of CSR elements on strategic decision-making and the disparities in the strategies employed by SMEs and MNEs. The study discovered that MNCs' decision-making processes for strategies, which are focused on international social issues, differ significantly. SMEs lack resources and typically base their decisions on their own emotions, the company's finances, friends, and family. Despite this, they are quite flexible in implementing their decisions and have a very good touch with the external world**.**

(Carpenter & Jones, 2015) examine the impact of managers' decisions to allocate funds to SS projects. The result found that non-financial metrics highlight SS investments and, in doing so, encourage the organization and manager to adhere to social norms.

(Rodrigues & Borges, 2015) aims to investigate the association between customer views of CSR and apparel brand Salsa purchasing patterns. Additionally, to determine whether the customer is aware of what social responsibility means in the contexts of the economy, society, and environment. The result found that individual worries about the environment and recycling had a significant impact on customer decisions that affect their purchase of the company's products, and consumers have multiple dimensions of their perceptions of corporate social responsibility.

(Humphreys & Trotman, 2022) focuses on the impact of SS reporting, and the influence of CSR assurance and reports on CSR reports during the COVID-19 pandemic. The study discovered that the substance of CSR reports, the demand for assurance, and spending on sustainability problems can all be impacted by growing financial demands. Additionally, modifications to the work environment and the economy have a direct impact on how accounting judgment experiments are designed.

Based on the above, we can reach the following hypothesis:

H2. SS has a statistical influence on decision-making in Sudanese manufacturing firms.

Environmental Sustainability (ENV)

The primary driver of ENV deterioration is industrial activity, which dates back to the 18th century and occurred when traditional agricultural practices were replaced by manufacturing in many towns. Over time, the drawbacks and consequences of the Industrial Revolution became apparent, including increased land consumption and pollution from factories (Beredugo, 2012). The fast expansion of manufacturing businesses globally has resulted in both a negative impact on the environment and an improvement in the standard of life. Manufacturing companies release a substantial amount of air pollutants into the atmosphere, which is bad for the ecosystem and all living things. Industry technology can improve sustainability through waste and emissions reduction (Izzat & Barakat, 2024)**.** Customers' growing awareness of environmental issues and government restrictions is putting increased pressure on businesses to adopt eco-friendly operations. To overcome these obstacles, industry and academics have felt forced to respond quickly to address environmental protection problems (Rahman et al., 2024).

There is a lot of demand for businesses to provide environmental information in their yearly reports. The government and the firm's stakeholders are among the many social groups making these demands. Furthermore, the corporation shares environmental information out of a desire to enhance its performance and a fear of damaging its reputation (Elshabasy, 2018). The accounting profession views itself as being crucial to the development of disclosure practices that can support more inclusive public decision-making because of the nature of accounting information and its purpose of providing different information that meets the shift toward pressing environmental issues. Accountants are now more involved in the disclosure of environmental data from government agencies, non-governmental organizations, and public and private businesses (Andrew & Cortese, 2011). Users can gain insights into the environmental impact of organizations through environmental accounting, which is advantageous for them. It has the potential to lessen the negative effects on the environment caused by waste emissions and environmental loads from commercial companies. Additionally, it offers helpful data on calculating the environmental impact of each organizational operation. It also facilitates clear disclosure of the results of environmental practices to the organization’s stakeholders, enhancing the company’s reputation (Barman & Saikia, 2016).

DOI: 10.55643/fcaptp.5.58.2024.4506

(Boyce, 2000) intends to address the widespread concern that the ENV is currently experiencing. The study concluded that it is challenging to imagine financial accountability as the only mechanism that holds public sector actors accountable to the public for their activities, while also satisfying the requirements of disclosure and the prudent, efficient use of resources.

(Almeida et al., 2007) concentrate on deepening knowledge of the true impact of various inputs and the worldwide sustainability of production processes, particularly in the industrial sector. The study found that assessment of the real state of a particular process is made possible by energy accounting and indices that evaluate industrial sectors and production processes. Additionally, it permits an open display of the findings and could act as a conduit between decision-makers and energy scientists. Governments and society will have a powerful instrument to set policies and select options for the environment.

(Leach & Mumford, 2011)focus on accounting for pesticides, which offers a financial assessment of the effects of pesticides on the soil per acreincluding , approximations of the prices of external pesticides in Germany, the USA, and the UK. The study discovered that crop production systems contributed to lower pesticide use.

(Dos Santos et al., 2019) focus on identifying the relationship between sustainability and decision-making. The study concluded that the complexity of SD is mirrored in the decision-making process. Also, Sustainable decision-making entails intricate relationships between factors, especially environmental issues, necessitating active participation from all.

Based on the above, we can reach the following hypothesis:

H3. ENV has a statistical influence on decision-making in Sudanese manufacturing firms.

AIMS AND OBJECTIVES

The paper's goal is to ascertain how important the dimensions of SA (economic, social, and environmental) are to decision-making in Sudanese industrial companies. Considering this, I have highlighted several issues with sustainability information in industrial enterprise operations:

1. Lack of information systems to help apply dimensions of SA to the Sudanese industry.
2. The need for guidelines or frameworks that encourage industrial companies to implement SA.
3. A deficiency in the organization of most Sudanese industry sectors.
4. There is an absence of research on this topic within the Sudan.

This article provides an overview of Sudanese accountants' perspectives on the dimensions of SA, something that is noticeably absent from the literature. Furthermore, it contributes to the growth of Sudan's industrial sector and enhances the country's economy.

METHODS

This study's population comprised responses from accountants at Sudanese industrial companies. The final sample comprised 120 accountants. Data for the current study were collected by a questionnaire. The introduction paragraph explains the goal of the study and provides definitions for some terms found in the questionnaire. The questionnaire was separated into two parts in addition to the introduction: The economic, social, and environmental aspects (ED, SD, and ENV) of sustainability accounting are the independent variables that are measured in the first part. Decision-making (DM) dependent variable is measured in the second part.

The statistical programs Spss28 and Amos 26 were used to examine the data collected.

RESULTS

Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis (CFA) was used in this study to assess the three-factor model's fit and identify the best fit with the data gathered. The evaluation made use of several statistical metrics, the Chi-Square to degrees of freedom ratio ($\chi 2/df$) came back at 1.738, which is below the accepted cutoff of 3 or 5, implying a fair congruence between the model and the data (Schermelleh-Engel et al., 2003). This indicates a good match. The model's dependability is highlighted by the Comparative Fit Index (CFI), which was reported at 0.940 and above the 0.90 benchmark for an adequate model fit.

With a value of 0.924, the Tucker-Lewis Index (TLI) indicates an ideal fit and is greater than the 0.90 criterion. The model's adequacy was further validated by the Root Mean Square Residual (RMR) at 0.065, which was within the acceptable range (Bentler, 2007).

But at 0.078, the Root Mean Square Error of Approximation (RMSEA) was marginally below the preferred cutoff point of 0.08. When taken as a whole, these indices support the CFA model's somewhat high degree of accuracy in this investigation. This study (Figure 1 and Table 1).

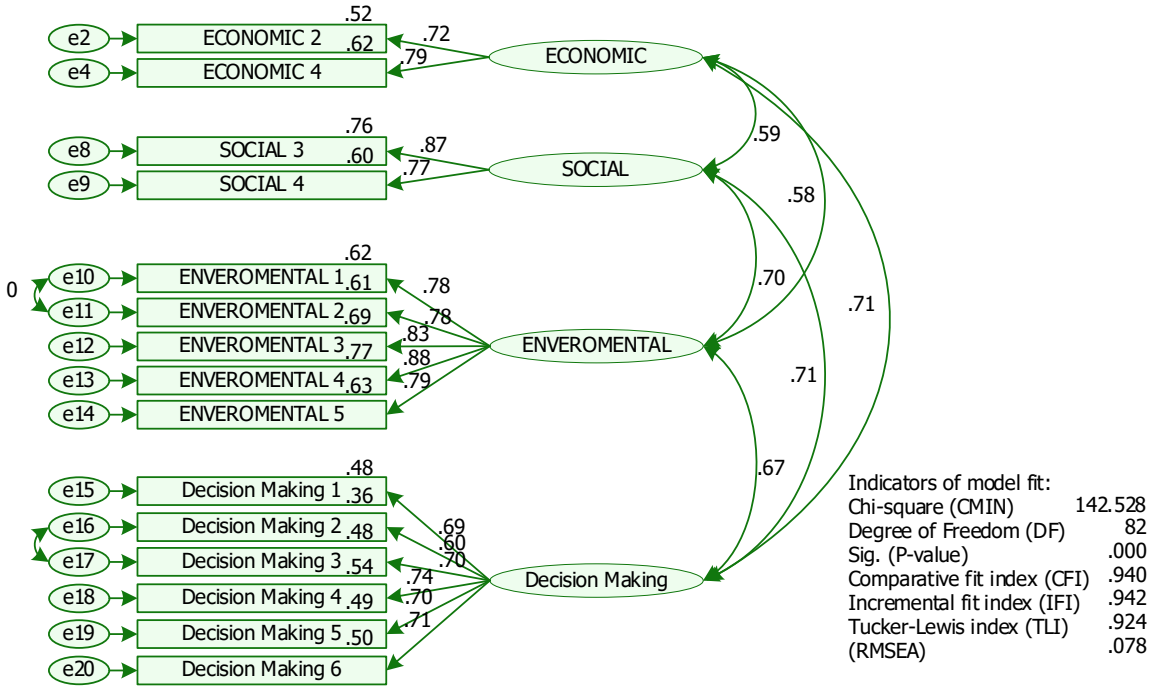

Figure 1. Confirmatory Factor Analysis.

CFA after Modification

The same metrics that can be used to compute goodness of fit are revealed in the structural model of confirmatory factor analysis (CFA) and are displayed in Table 1. This is the outcome of the unidimensional CFA.

Table 1. Model fit statistics for CFA.

Measure	CMIN	DF	CMIN/DF	CFI	SUMMER	RMSEA	PClose
Estimate	142.528	82	1.738	0.940	0.065	0.078	0.020

Reliability and Validity Testing Measures

As shown in Table 2, Cronbach's coefficient alpha was calculated to evaluate the internal consistency and reliability of the scales. Every construct used met the acceptable criteria of Cronbach's alpha, and all of the constructs used in this study were above 0.70.

Table 2. Model Validity Measures.

	CR	AVE	MSV	MaxR(H)	ECO	SOC	ENV	DM
ECO	0.726	0.571	0.508	0.731	0.756			
SOC	0.810	0.681	0.499	0.825	0.594***	0.825		
ENV	0.907	0.662	0.496	0.912	0.582***	0.704***	0.814	
DM	0.845	0.477	0.508	0.848	0.713***	0.706***	0.668***	0.691

DOI: 10.55643/fcaptp.5.58.2024.4506

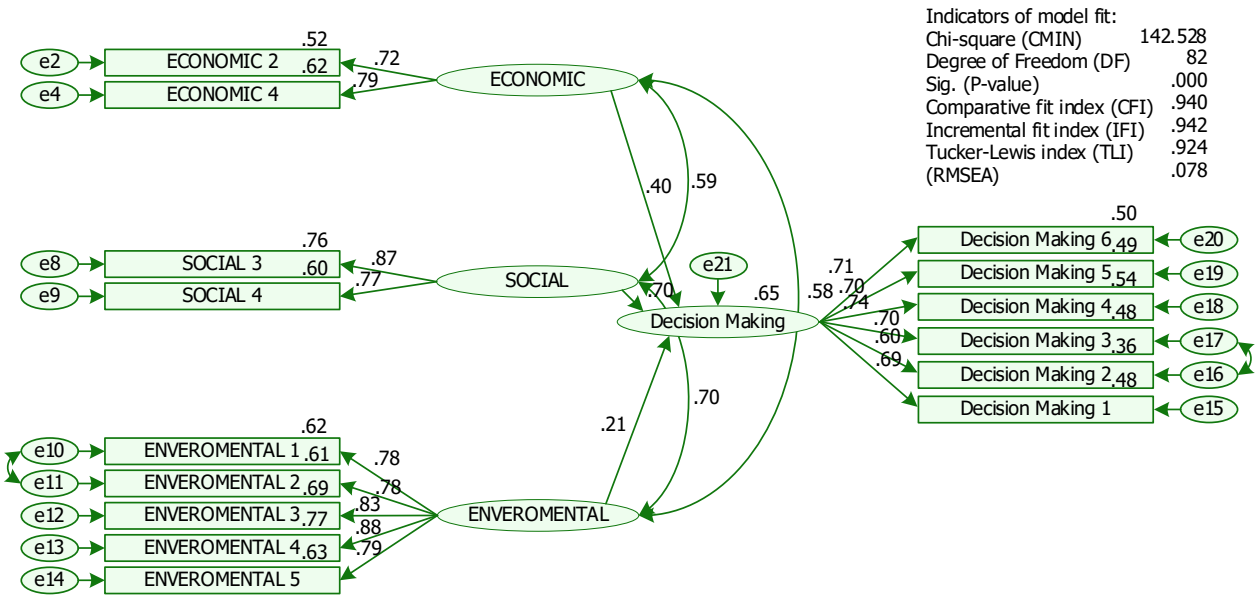

Figure 2. Research Model.

The model fit value displayed in Figure 2 is also revealed by the structural model; all model fit indices for the structural model were not only significant but also stayed consistent with the measurement model. The underlying theoretical model is justified by the high R square index (i.e., 0.65).

Table 3. Hypothesis significance and results.

			Estimate	S.E.	C.R.	P	Result
DM	<---	ES	.368	.124	2.962	.003	**Support**
DM	<---	SS	.260	.115	2.263	.024	**Support**
DM	<---	ENV	.138	.087	1.597	.110	**Not Support**

According to Table 3, The first hypothesis (H1) suggested that the ES positively and significantly impacts Decision-making in Sudanese manufacturing. The data verifies H1, demonstrating a significant influence of the ES on DM in Sudanese manufacturing with the optimal variance. ($\beta = 0.368$, $t = 2.962$, $p < 0.003$).

The second hypothesis (H2), suggested that SS positively and significantly influence Decision-making in Sudanese manufacturing. The data verifies H2, demonstrating a significant influence of the SS on decision-making in Sudanese manufacturing with the optimal variance. ($\beta = 0.260$, $t = 2.263$, $p < 0.024$).

The third hypothesis (H3) suggested that the ENV positively and does not significantly influence DM in Sudanese manufacturing. The data verifies H3, demonstrating a significant influence of the environmental dimension on DM in Sudanese manufacturing with the optimal variance. ($\beta = 0.138$, $t = 1.597$, $p > 0.110$).

DISCUSSION

The need to adopt effective SA is growing urgently since sustainability is recognized as the essential component of enhancing society and businesses. Increasing awareness of sustainability, and management decision-making through problem-solving are essential to the growth of SA. Enhancing management decision-making ought to be the primary focus of the development of SA.

Sudan is one of the countries of East and Central Africa and depends on traditional agriculture, placing it in the category of countries with little industrial production. Sudan was thus ranked 147th out of 187 countries around the globe. According to the 2001 Comprehensive Industrial Survey, the GDP is currently represented by 8.5% of industrial output. The industrial sector has also been negatively affected recently by the civil war that broke out in April 2023.

The research enabled the validation of the viewpoint of numerous academics (Bolis et al., 2017), (Kandakoglu et al., 2019), (Palm et al., 2021) and (Tereshchenko et al., 2024) that the inclusion of ED in the DM process. Moreover, the outcomes are consistent with the findings of previous research (Anagnostopoulos et al., 2014), (Mousiolis et al., 2015), (Carpenter & Jones, 2015), (Rodrigues & Borges, 2015), and (Humphreys & Trotman, 2022) that found a role for SD in DM in Sudanese industrial companies.

On the other hand, the study's findings are different in that there isn't a connection between the environmental dimension and DM in Sudanese industrial establishments, the study (Boyce, 2000), (Almeida et al., 2007), (Leach & Mumford, 2011) and (Dos Santos et al., 2019).

CONCLUSIONS

This research investigates the role of SA (economic, social, and environmental) in the decisions made by Sudanese industrial companies. Also, the research aims to bridge the gap in earlier research on SA and decision-making issues in Middle Eastern countries in general and Sudan in particular.

The study's findings allow for the assertion that ES and SS dimensions have a key role in the DM according to the examination of statistical data. But the clear absent role of the environmental dimension in the decision-making. This is due to the ineffectiveness of environmental protection laws, and the failure of the accounting profession's regulatory bodies to establish sufficient frameworks and guidelines for accountants to disclose their environmental role.

The primary limitation of the study is reflected in the sample 120 responses from the respondents. The reason is that Sudan was affected by internal conflict and the closure of many factories in places where there were military battles in middle and western Sudan. Furthermore, use only questionnaires to collect data since it is challenging to collect quantifiable data. Further studies on this subject can be conducted with larger sample sizes, especially if they are conducted globally.

The research suggests the following:

1. Accounting regulators must develop guidelines and frameworks to help accountants measure and disclose sustainability information.
2. Establishing a specialized department in the Sudanese Ministry of Industry concerned with monitoring the environmental and social performance of factories and developing and activating environmental protection legislation.
3. Raising awareness of sustainability issues among accountants and administrators in industrial companies.
4. To help Sudanese industrial establishments develop strategies that will enable them to meet the needs of the Sudanese market, further research is required to determine the influence of SA challenges on these establishments.

ADDITIONAL INFORMATION

FUNDING

This study is supported via funding from Prince Sattam bin Abdulaziz University project number (PSAU/2024/R/1445).

CONFLICT OF INTEREST

The Author declares that there is no conflict of interest.

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РОЛЬ БУХГАЛТЕРСЬКОГО ОБЛІКУ СТАЛОГО РОЗВИТКУ В УХВАЛЕННІ РІШЕНЬ: ГАЛУЗЕВЕ ДОСЛІДЖЕННЯ СУДАНСЬКИХ ПРОМИСЛОВИХ КОМПАНІЙ

Мета дослідження полягає в тому, щоб вивчити, як компоненти бухгалтерського обліку економічної, соціальної та екологічної стійкості впливають на ухвалення рішень у промисловому секторі Судану. Це може допомогти компаніям зрозуміти й розкрити переваги та недоліки своєї діяльності. Практичне значення наукового дослідження полягає в тому, що його висновки допоможуть прояснити проблеми, пов'язані зі сталим розвитком, і зміцнити прихильність

DOI: 10.55643/fcaptp.5.58.2024.4506

суданських промислових підприємств до них. Крім того, існує не так багато досліджень, які розглядають цю тему в контексті Судану.

Результати дослідження свідчать, що ухвалення рішень для промислових підприємств Судану має економічний вимір. Також було виявлено, що соціальний вимір відіграє певну роль в ухваленні рішень. З іншого боку, при ухваленні рішень промисловим підприємствам Судану бракує екологічного виміру. Згідно з рекомендаціями дослідження, регулятори бухгалтерського обліку повинні розробити керівні принципи та рамки, щоб допомогти бухгалтерам вимірювати й розкривати інформацію про сталий розвиток, необхідні подальші дослідження для визначення впливу питань сталого розвитку на виробничі потужності Судану та підвищення обізнаності з питань сталого розвитку серед бухгалтерів і керівництва.

Ключові слова: сталий облік, економічна стійкість, соціальна стійкість, екологічна стійкість, ухвалення рішень, сектор промисловості

JEL Класифікація: Q01, L00