

GREEN CONCEPTS AND MATERIAL FLOW COST ACCOUNTING APPLICATIONS FOR MANUFACTURING COMPANY: APPROACH FOR COMPANY SUSTAINABILITY

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Abstract

Cosmetic items and medical supplies work together to provide community with effective management of medical concerns. Manufacturers begin the management of cosmetic products and pharmaceuticals within the parameters of the market and ethical business practises. The purpose of this study was to implement green ideas and MFCA at Al-Mansour Pharmaceuticals & Medical Supplies & Beauty in Iraq and also find out the impacts on the company's sustainability in terms of various aspects. Multiple regression models were employed via SPSS 23. The research revealed that findings led to the formulation of a variety of managerial implications for preserving the integrity of the company sustainability scale, including recommendations for improving manufacturing process capability.

Keywords: *Material flow cost accounting, green concepts, sustainability, manufacturing industry, application*

INTRODUCTION

By examining simultaneously material flow and monetary instruments, MFCA is recognized as an excellent instrument to accomplish both ecological and economic goals [1]. Since then, it has drawn significant interest in both practice and academics [2-4], integrating together a diverse spectrum of perspectives including managerial accounting, environmental economy, and green innovation. Additionally, MFCA is a decision-making tool that firms utilize in an effort to increase corporate efficiency while cutting expenses through eliminating waste [5].

Five phases make up the implementation procedure under the MFCA: (1) involving governance and instituting accountabilities; (2) establishing a material flow framework and defining the nature and extent of the procedure; (3) assigning resource costs; (4) analyzing and interacting MFCA results; and (5) enhancing processing parameters and limiting material loss as a result of MFCA results [6]. The International Organization for Standardization has laid out these actions as a conceptual approach in ISO 14051. Overall, MFCA has emerged as the instrument for financial management and accountability that shows the promising performance. It is a crucial aspect of the framework for Accounting for Environmental Management (EMA) [7].

According to the 2030 agenda for sustainable development, the process of growth should take advantage of the capabilities of environmental assets to the fullest extent possible while still addressing the demands of the present. According to study [8], sustainability is "characterized as development that fulfills the requirements of the present without jeopardizing the capacity of future generations to satisfy their own requirements". It is necessary to simultaneously adapt the economic, environmental, and equity principles to achieve sustainable development. Corporate Sustainability Management System (CSMS) was conceptualized into five stages: policy creation,



strategy, execution, communication, assessment, and modification [6]. Sustainability has emerged as the dominant buzzword in both the corporate environment and the overall community. Three requirements must be met for the deployment of a sustainability system: a sustainable environment, economic, and social system. This approach is frequently used in business, government, agriculture, health care, and other sectors [9, 10]. The pattern of manufacturing technologies allows businesses conserve revenue, enhance their competitiveness, and lessen the effects on the environment, health, and security. Individuals who use financial accounts are constantly focused on the effectiveness and productivity of resource consumption within the organization, particularly the manufacturing cost [11]. Marota et al. (2015) assert that an industrial corporation's production cost is a significant cost factor and that, in order to reduce production costs, businesses should concentrate on resource efficiency [12]. A crucial component of the management strategy known as monitoring and management, MFCA focuses on managing the production techniques connected to material flow, energy, and data in order to make the production process work more efficiently and in line with the established objectives [13-15].

In order to create a sustainable environment, a business must consider five factors: economic sustainability, social indicators, environmental analysis, sustainability indicators chosen on their own, commodities, and supplies employed [16, 17]. In Al-Mansour Pharmaceuticals & Medical Supplies & Beauty, Iraq, issues arise in all aspects of corporate sustainability, including the economy, society, ecology, and science, and they begin with manufacturing cost-effectiveness and productivity standards in addition to industrial waste treatment. The "Guidelines for Management of Medical Devices" published by the Directorate of Medical Support Services and Health Ministry should be consulted while producing medical products. This policy states that the main procedures are the responsibility of the healthcare distributors: Evaluation of the demand for health tools, design and development, design implementation, manufacturing, packing, and labeling, source network maintenance, records maintenance, administration of material waste, and mechanism of instrument infection. The term "green industry" refers to both the creation of ecofriendly industry and execution of an efficient industrial system [18].

A study included production, where it is referred to as a sustainability production process or sustainable manufacturing. Marota et al. (2015) did earlier research on MFCA to ascertain effects on company's sustainability. The findings indicated a substantial relationship between corporate sustainability and the use of MFCA [12]. Studies demonstrated that technology utilization and management accounting tools had a substantial impact on assisting the business company's decision-making for waste minimization [19, 20]. The study demonstrates that MFCA can be utilised as a model to identify a company's production and business. This study's goals are to apply green ideas and the MFCA to Al-Mansour Pharmaceuticals & Medical Supplies & Beauty in Iraq, examine their effects on the aspects of corporate sustainability, and come up with recommendations for how to improve the performance of the business in terms of its sustainability.

METHODOLOGICAL APPROACH

From October to December 2022, the study was carried out at the business that produces pharmaceuticals and medical supplies in Iraq. Observations, in-depth structured interviews, and a combination of qualitative and quantitative research techniques were used in the research. Both primary and secondary data were used in this investigation. A questionnaire was sent to the concerning organizational administration, as well as to professionals who had participated in the MFCA training and external auditors of AL-MANSOUR PHARMACEUTICALS & MEDICAL SUPPLIES & BEAUTY, IRAQ, with a maximum of 30 respondents. The financial statement data of AL-MANSOUR PHARMACEUTICALS & MEDICAL SUPPLIES & BEAUTY, IRAQ for the years 2019-2022, literature review, as well as existing studies and publications, served as the source for secondary data. The characteristics used in the research design were used to analyze and interpret the accounting information material. According to Persada et al. (2014) [21], the sampling technique used to gather the data was proceeded with an extensive survey of the participants to acquire rationale for the designation of the indicators and levels. The descriptive statistical approach was employed for



the implementation of sustainability and MFCA based on the implementation steps of sustainability and MFCA at AL-MANSOUR PHARMACEUTICALS & MEDICAL SUPPLIES & BEAUTY, IRAQ, utilising a mixed approach. Table 1 gives descriptions of each variable. The following research hypotheses were addressed using multiple regression analysis in order to quantify the impact of green ideas and MFCA on the elements of business sustainability:

H1: The application of green concepts and MFCA has significant impact on company’s sustainability.

H0: The application of green concepts and MFCA has not any significant impact on company’s sustainability.

Multiple regression analysis is used to forecast the rise and fall of the dependent variables when two or more independent variables are utilized as predictor factors and their values are changed, increased, or decreased, according to Sugiyono (2013) [22]. According to how the aforementioned characteristics were described, our study included 6 (six) independent variables. The following equation is a model of multiple regressions that was:

$$Y = \alpha + B_1 X_1 + B_2 X_2 + B_3 X_3 + B_4 X_4 + B_5 X_5 + B_6 X_6$$

Table 1-Description of variables			
Variable	Dimensions	Measurements	Reference
Green concepts and MCFA	X1, X2, X3, X4, X5, and X6	Monetary, production, processing unit	[23]
Sustainability	Economy	Sales, net income, and investment	[24]
	Environment	Costs of waste treatment, and other utility costs	
	Social	Costs of salaries, benefits and pension	
	Technology	Costs of supplies, research and development	

*Production cost (X1)

*Area width of production unit (X2)

*Production value (X3)

*Production material flow (X4)

*Green process (X5)

*Green product (X6)

Figure 1’s schematic displays the conceptual framework for this study. This study will be supported by the existing phenomena and business facts that take place in AL-MANSOUR PHARMACEUTICALS & MEDICAL SUPPLIES & BEAUTY, IRAQ so that they can be analyzed to close the gap between the theories and basic themes and the green industry (green concepts) and MFCA. This will help to create production costs that are efficient and effective and support corporate sustainability.

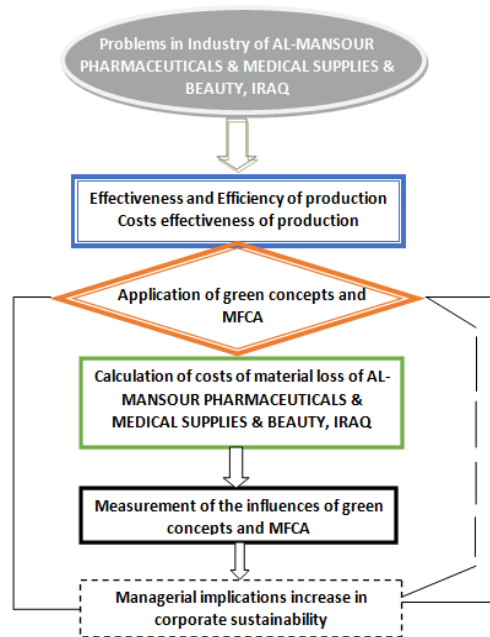


Figure 1- Conceptual framework of our study

RESULTS AND DISCUSSION

Profile of Al-Mansour Pharmaceuticals & Medical Supplies & Beauty, Iraq

An Iraqi company called Al-Mansour Pharmaceuticals Industries produces drugs, medical equipment, and cosmetics. The business was founded in 1992, and Baghdad is where its headquarters are. It is a privately held firm with no state ownership. The company's decision to limit its operations to the production of hospital medications and medical supplies is what has led to this enormous expansion. Al-Mansour Pharmaceuticals, Medical Supplies, and Beauty received a complete licence from the Iraqi Ministry of Health in 1992. Additionally, the business sells its goods to the World Health Organization (WHO), which subsequently distributes them to a number of Asian and Middle Eastern nations. Figure 3 provides a detailed breakdown of the numbers assigned to the current dimensions characteristics from 2019 to 2022 based on secondary data from Al-Mansour Pharmaceuticals & Medical Supplies & Beauty, Iraq.

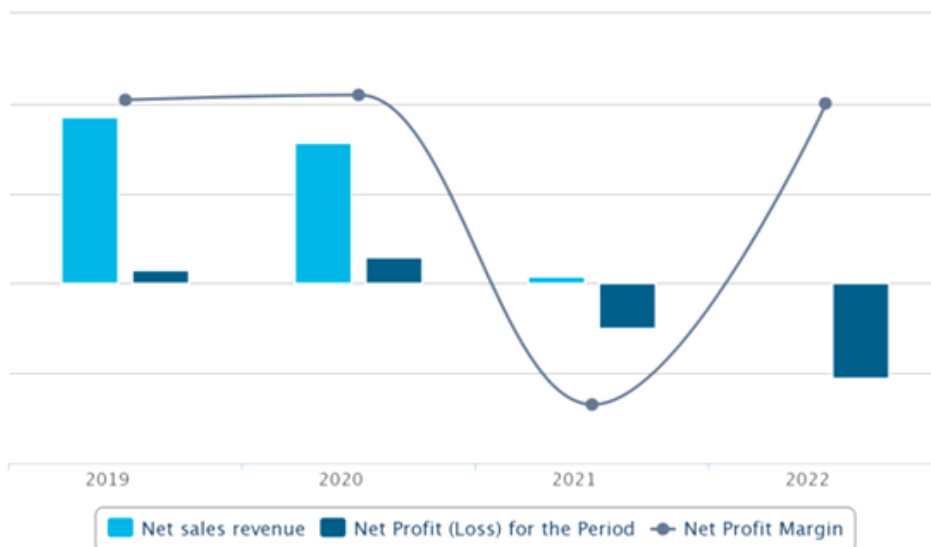


Figure 3-Company Performance 2019-2022 [25]

Application of Green Concepts at Al-Mansour Pharmaceuticals & Medical Supplies & Beauty, Iraq

Iraqi company Al-Mansour Pharmaceuticals & Medical Supplies & Beauty has implemented green ideas such as green process, green products, and green staff. Reinforced by the attitudes of dedication, participation, and management, sustainable approach helps the company policy, which is incredibly concerned with concerns of protection and environmental sustainability, protection, and employee safety. Utilizing ecofriendly commodities or conserving energy and resources aids manufacturing techniques. Green products aid in the development of goods with ingredients that are safe for human consumption and the environment, as well as sustainable power consumers. Green employees will encourage everyone in the organization to adopt green behavior in their daily operations.

MFCA Application

The revenue stream framework, budget characterization, and performance evaluation costs make up the three elements that make up the general MFCA technique, as explained in study [26]. The design and implementation of MFCA begin with a description of the seven stations that make up the quantitative centre, analysis of the material allocation by weight and cost, and determination of production waste costs due to material loss. Al-Mansour Pharmaceuticals & Medical Supplies & Beauty, in Iraq, uses sequential processing, or a pattern of processing where a unit moves from one process to another in a succession of steps. The MFCA diagram appears in Figure 4.

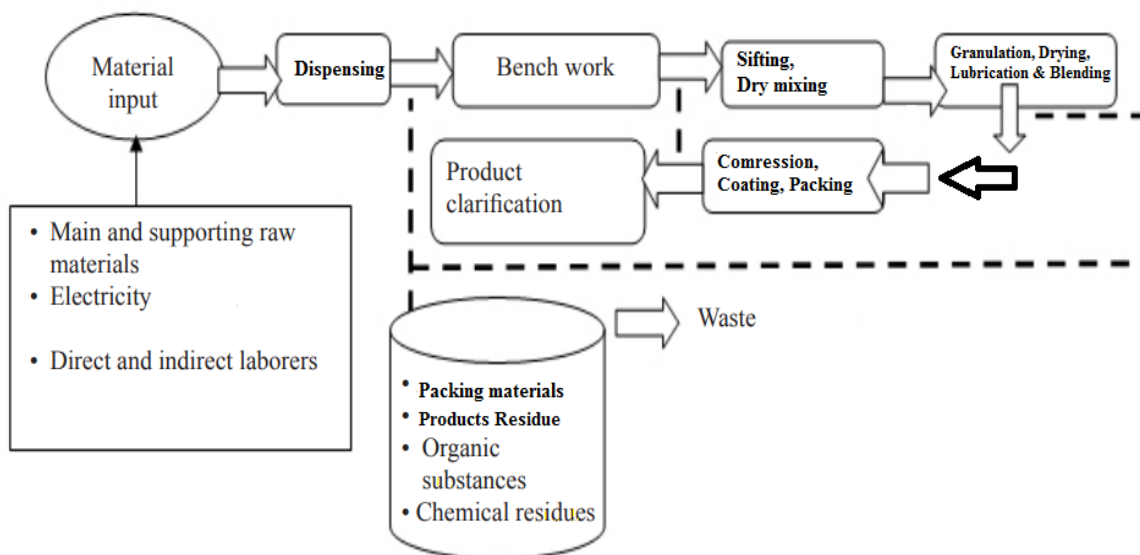


Figure 4-MFCA Diagram of Al-Mansour Pharmaceuticals & Medical Supplies & Beauty, Iraq Measures of the Impact of Green Initiatives and MFCA on Aspects of sustainability Al-Mansour Pharmaceuticals & Medical Supplies & Beauty, Iraq

With a 95% confidence level, multiple regression analysis was used to measure the impacts of green initiatives and MFCA on Al-Mansour Pharmaceuticals, Medical Supplies, and Beauty's sustainable parameters. The following are the full findings of the measurement of the impacts:

Ratio of Reliability (R) and Variables (Adjusted R Square)

Table 2 displays findings of correlations and variables. As is evident from the outcome of the regression analysis above, the parameters of firm sustainable development and those associated with green conceptions and MFCA have a very significant link, with a R value (correlation coefficient) of 0.753.

Table 2-Measurement of correlation and determinants						
Model	R	R. Square	Adjusted square	R	Std. Error Estimate	of
1	0.753a	0.567	0.454		0.34453	

a. Predictors: (Constant), X₆, X₄, X₁, X₅, X₂, X₃

F-Test



In Table 3, F-test was applied and presented outcomes from the research variables. The H_0 hypothesis is accepted based on the F value counted $> F$ table ($5.013 > 2.528$) and Sig. > 0.05 ($0.142 > 0.002$), and as a result, the green ideas and MFCA variables have a significant impact on the corporate sustainability variables.

Table 3-Measurement of F Test

Model		Sum of squares	df	Mean Square	F	Sig.
1	Regression	3.570	6	.595	5.013	0.02 ^b
	Residual	2.730	23	.119		
	Total	6.300	29			

- a. Dependent Variable: Y,
- b. Predictors: (Constant), X_6 , X_4 , X_1 , X_5 , X_2 , X_3

t-Test

Table 4 presents the findings of the t test. A significance value of <0.05 ($0.003 < 0.05$) for the production cost dimension indicates that it significantly affects the corporate sustainability factors. The production area dimension strongly affects the corporate sustainability factors with a significance value of <0.05 ($0.000 < 0.05$). The production value dimension significantly affect the corporate sustainability factors either, as evidenced by its significance value of 0.05 ($0.004 < 0.05$). Additionally, the manufacturing material dimension has a significance value less than 0.05 ($0.047 > 0.05$), indicating that it obviously impacts the viability of the company. More details have been given below (Table 6).

Table 6- Measurements of t-Test

Model		Un-standardized co-efficient		Standardized co-efficient	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.332	.107	.448	3.093	.004
	X1	.329	.104	.442	3.080	.003
	X2	.228	.101	.398	2.092	.000
	X3	.281	.174	.420	2.844	.004
	X4	.121	.165	.176	.733	.047
	X5	.281	.185	.321	1.844	.051
	X6	.334	.108	.500	3.095	.005

- a. Dependent variable: Y
- The t test's outcome reveals that each aspect of the variables related to green concepts and MFCA has a substantial impact on the variables associated with company sustainable development.

MANAGERIAL IMPLICATIONS

Management consequences for the development of the manufacturing process's performance process will be developed prior to the conclusion of the investigation. According to Saftiana et al. (2014) [26], the formulation of the production performance of Al-Mansour Pharmaceuticals & Medical Supplies & Beauty, Iraq, should be limited to the productivity and effectiveness of manufacturing cost with a concentrate on the importance numerous processes. Performance and efficiency can be improved using the MFCA construct, according to Marota et al. (2017) [27], with development initiatives aimed at achieving cost effectiveness, minimizing losses and resource failures, and supporting sustainability with the remanufacturing of remnants in the form of managerial implications. Al-Mansour Pharmaceuticals & Medical Supplies & Beauty, Iraq, can regulate the operations of businesses that offer added value (value added activities) and reduce the time for non-value numerous processes by using the management approach of appropriate prices. In order to maximize profits as well as provide protection for investors as per shareholder values, the


business is expected to maintain a competitive advantage, accomplish the basic complying of the commodities.

CONCLUSION AND RECOMMENDATIONS

It is concluded that outcomes of statistical analysis have substantial influence on the company's sustainability and green concepts concentrate on the implementation and creation of ecofriendly products, whereas MFCA concentrates on the cost of material loss and production waste generated. According to a prior study on MFCA by Marota et al. (2017) [27], the design and execution of MFCA have a substantial impact on the improvement of firm sustainability. There is a correlation between the findings of this study and the potential for information transparency provided by MFCA regarding the flow of materials and energy, including support for management's decision-making for reuse of energy, labour, and waste disposal. There are just a couple of the recommendations made as a result of the analysis for Al-Mansour Pharmaceuticals & Medical Supplies & Beauty, Iraq. The company can also employ a significant competitive administration strategy to control the valuation processes and shorten the time spent performing non-value-added items. The MFCA will encourage and bolster the use of green ideas at the Iraqi company Al-Mansour Pharmaceuticals & Medical Supplies & Beauty.

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