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Impact of Green Accounting Disclosures on Sustainability of Manufacturing Firms in Nigeria

Obiora Fabian. PhD, **Nwamah Kenechukwu. C**

Department of Accountancy, Chukwuemeka Odumegwu Ojukwu University, Igbariam, Anambra State, Nigeria

ABSTRACT

Background: Green accounting mainly focuses on the role in which an enterprise has toward the environment. A suitable environment has a positive impact on the business sector by creating an appropriate environment for enterprising. Green business is the modern trend in organizations as it focuses on profit, people and the planet which led to green marketing, where products sold are environmentally friendly.

Aim: This study was carried out to examine the impact of green accounting disclosures on sustainability of manufacturing firms in Nigeria. In order to determine the relationship between green accounting disclosures and organizational sustainability, green accounting disclosure was proxy using waste management disclosure (WMD) and pollution control & environmental remediation disclosure (PC&ERD) while sustainability on the other hand was measured using Kinder Lydenberg Domini (KLD) social-environmental performance rating system.

Materials and Methods: The study adopted Ex Post Facto Design and data were collected from the annual reports and accounts of industrial goods firms in Nigeria for the period ended 2016-2020. OLS model was used in the data analysis for the study.

Results: The findings of the study indicate that waste management disclosure (WMD) and pollution control & environmental remediation disclosure (PC&ERD) have significant and positive impact on firms' sustainability at 1% significant level.

Conclusion: Thus, the study concludes that green accounting disclosures ensure organizational sustainability in Nigeria.

Recommendation: In lieu of this, the study recommended that companies should design products which generate less waste, pollutants, toxic or emission during their life cycle. This can be carried out through life-cycle analysis and should also be incorporated in the financial reporting of such firm for financial statements users' consumption. With this development, the sustainability of such firm is ensured.

KEYWORDS: *Waste Management Disclosure, Pollution Control & Environmental Remediation Disclosure Sustainability*

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1. INTRODUCTION

The environmental issue has become a global concern in the last decades being the spotlight in different forum both at national and international levels. Environmental challenges are rooted in economic and social policies, they occur at all levels from local to global, and solutions demands action by many players over long period of time. The industrial revolution has brought economic improvement in almost all our sphere of lives, greater prosperity, improved health, better and easy way of doing things, indeed it is synonymous to economic development. The use of natural resources is vital to economic development and it is not without environmental consequences such as environmental and atmospheric pollution, oil spillage, and desertification, destruction of ozone layers, global warming and climate change that is inimical to our existence. Nigeria as a developing country in the quest for economic advancement continues to exploit the natural resources and hence the correlation between the Nigeria's GDP and Natural resources consumption (Adediran & Alade, 2013).

Environmental pollution is one of the problems facing the world today, due to its impact on society, nature and performance (Khan & Ghouri, 2011). The phenomenon of environmental pollution has received increasing attention in recent times, especially in light of the industrial progress in the contemporary world and the diversity of sources of pollution, and the attempt of industrial companies to get rid of its waste is harmful to the environment and people (Chinwe, 2013). According to Malik & Mittal (2015), green accounting is important for developing economies, this is because green accounting helps in saving environmental and development problems. Environmental accounting will help countries in addressing the economic problems associated with climate change. As cited in the study of Almaliki (2020), the world losses a significant amount of money due to environmental changes. Green accounting would help in solving environmental changes leading to improved performance for companies and firms operating in developing countries. Firms that have adopted green accounting have led to reduced operational costs during environmental changes.

The concern for the environment was thus considered premature by some analysts. It was indeed reasoned that Third World countries could ill-afford the luxury of being concerned with the environment at the expense of the attempt to break off the shackles of poverty and underdevelopment. Interestingly, most developing nations have today experienced serious effects of environmental degradation. This has in turn impacted positively on the level of environmental awareness of these nations, including Nigeria. However, there is yet a yawning gap between the increasing green accounting awareness in one hand and effective positive actions towards green accounting on the other hand. The unfortunate situation exists at the levels of government, corporate bodies, communities and individuals.

In Nigeria, the articulation of green accounting concerns (costs and benefits) into financial reporting is still at a fetal or development stage. Companies do not provide clear cut environmental sections in their annual reports. Green disclosure provided therein is usually scanty and trivial. It is apparently clear that the study of Nigeria's sustainable development is unfortunately plagued with problems that go beyond environmental and ecological abuse/mismanagement. Therefore, it is pertinently worthwhile to critically look at some of the basic sustainable development issues that necessitated green accounting with more practical strategies that will bring adequate healing to the nagging illness in Nigeria. It is against this background that this study examined the relationship between Green Accounting Disclosures and Sustainability among the quoted Industrial Goods Firms on Nigerian Exchange Group (NGX).

Also, it is obvious that green accounting has become a mainstream trend in the world, and legislation of related laws is necessary. Once green accounting is enforced by the government, enterprises are required to internalize the external costs of the production activities, thus increasing the production and operational costs. However, green accounting disclosures are voluntary and discretional and a large number of firms are still apathetic about their green disclosures as they are unaware of the connection between green accounting disclosures and their performance. Based on this observation, this study considered it imperative to examine the relationship between green accounting disclosures and sustainability of firms in Nigeria using quoted firms under industrial goods sector as a reference.

To achieve this purpose, the following hypotheses were formulated:

H_{01}: Waste Management Disclosure has no significant impact on Sustainability of Manufacturing Firms in Nigeria

H_{02}: Pollution Control and Environmental Remediation Disclosure have no significant impact on Sustainability of Manufacturing Firms in Nigeria

2. Review of Related Literature

2.1. Green Accounting

According to Bartelmus and Seifert (2018), green accounting is a new branch in accounting for the environment and its well-being. Green accounting mainly focuses on the role in which an enterprise has toward the environment. Environmental change has a bearing change in not only the environment but also in the economy. A suitable environment has a positive impact on the business sector by creating an appropriate environment for enterprising. Green business is the modern trend in organizations since green business focuses on profit, people and the planet; it has led to green marketing, where products sold are environmentally friendly (Cho & Patten, 2013).

Green accounting measures and recognizes environmental costs, other social costs, and presents information in the financial statements. In the last two decades, green accountants have approached one aspect of material cost accounting (Nakajima, Kimura & Wagner, 2015). Green accounting is a subset of sustainability reporting. In research and accounting literature, green accounting is often and variously used as sustainability report, corporate social and environmental disclosure, corporate environmental report among others (Ogoun & Ekpulu, 2020).

2.1.1. Green Accounting Disclosures

Almaliki (2020) sees green accounting disclosure as a disclosure on how the environment affects the financial accounting system in terms of costs and benefits, that is, it is an approach to measure and communicate information related to environmental activities of economic units with environmental impact to the parties concerned and society in a manner that enables control and evaluation of their environmental performance. Green accounting has led to sustainable development by creating a peaceful environment for the enterprise (Gray & Laughlin, 2012).

According to Cohen and Robbins (2011), green accounting disclosure is disclosure on indirect costs and benefits of economic activity, such as environmental effects and health consequences of business decisions and plans. The ultimate goal of green accounting or environmental accounting at any organizational level is aimed to determine the organization's needs to make sure that the economy has a good level of efficiency for its environmental preservation activities and the company's overall business operations (Kundu & Hauff, 2009).

2.1.2. Organizational Sustainability (OS)

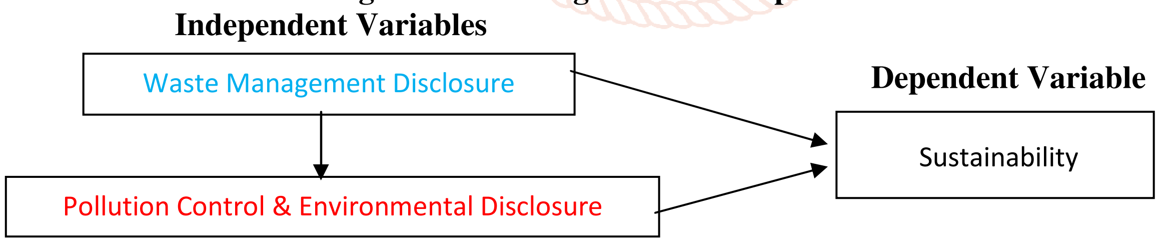
Omaliko, Okeke and Obiora (2021) assert that OS is having the leadership, global insights, talent and change in strategies necessary to rise to the unique challenges facing the organizations. From the perspective of an organization, sustainability is the capability of an organization to transparently manage its responsibilities for environmental stewardship, social well-being, and economic shared value over the long term while being held accountable by its stakeholders (Pojasek, 2017).

Omaliko and Onyeogubalu (2021) noted that for organizations to be sustainable, the following shall be conceded:

- Be accountable for its impacts on the environment, society, and the economy
- Be transparent in its decisions and activities that impact its responsibilities
- Behave ethically
- Respect, consider, and respond to the interests of its stakeholders
- Accept that respect for the rule of law is mandatory

Organizational sustainability as a concept requires that organizations should map out and give effect to specific programmes in accordance with a well-defined social (Omaliko, Nweze & Nwadialor, 2020).

Figure 1: The Diagram of Conceptual Framework



Source: Researcher's Concept (2022)

2.2. Theoretical Framework

The theoretical framework which gives the meaning of a word in terms of the theory on green accounting disclosures and sustainability established in this study is Stakeholders Theory (ST). It assumes both knowledge and acceptance of this theory that this research work depends upon.

2.2.1. The Stakeholders' Theory

The theoretical foundation of this paper is anchored on the "Stakeholders' Theory". This theory was propounded by Freeman in the year 1983. The theory sees corporate organizations as the elements of the social system or group where the firm's success is dependent upon the successful management of all the relationships that a firm has with its stakeholders; those groups without whose support the organization would cease to exist. Freeman's stakeholders' theory asserts that, managers must satisfy a variety of constituents (example, employees, customers, suppliers, local community and so on) who can influence the firm's outcomes. According to this view, it is not sufficient for managers to focus exclusively on the needs of stockholders, or the owners of the business. This implies that it can be beneficial for the firm to engage in certain environmental activities that non-financial stakeholders perceive important, because without this, these groups might withdraw their support from the business.

The stakeholders' theory proposed an increased level of environmental awareness which creates the need for companies to manage these interests (groups' interest) in order for them to become environmentally friendly towards the environment in which the business is domiciled. The main concern of the stakeholders' theory in environmental accounting is to address the environmental disclosure elements and valuation and its inclusion in the financial statements for external users consumption (Omaliko, Nweze & Nwadialor, 2020).

Summarily, the stakeholder theory illustrates that the firm has one and only one goal – to satisfy the desires of shareholders by making profits. However, profit may not be attainable if the environment in which the business operates is neglected.

Thus, the study is anchored on stakeholders' theory, as its concern is to encourage business managers to carry out environmental practices which the non-financial stakeholders consider very important so as to maximize stakeholders' value as well as minimize environmental costs.

2.3. Empirical Review

Riyadh, Al-Shmam, Huang, Gunawan and Alfaiza (2020) analyzed green accounting (GA) impact on financial performance (FP). Secondary data and multiple regression analysis were employed in this research, such as CSR reports, sustainability reports, and financial statements. The selected corporations were 100 largest multinational corporations in the year 2018. Then, the green accounting used a proxy of the environmental cost (EC), while financial performance employed a proxy of Return on Capital Employed (ROCE). The finding of autonomous Green Accounting costs on financial performance has a negative relationship.

Oti, and Mbu-Ogar, (2018) examined the impact of environmental and social disclosure on the financial performance of quoted oil and gas companies in Nigeria. Time series data for five years were collected and analyzed using the ordinary least square regression technique. Results from the statistical analysis revealed that disclosure on employee health and safety and community development do not significantly affect financial performance while disclosure on waste management had a positive and significant effect on firm's financial performance. The study recommended that oil and gas companies should constantly review their waste management strategy and employ bespoke technology in waste management to mitigate their impact on the environment. Furthermore, Oil and gas companies should improve on employee health and safety as part of their mission and vision statement for enhanced firm value. Companies should also ensure sustained development of their host communities to avoid hostility by stakeholder groups which will have negative effect on its operations and in turn affects performance.

Eze, Nweze, and Enekwe, (2016) identifies environmental accounting issues and the effects of these environmental factors on the life of Nigerians. It was discovered that environmentally friendly organizations who voluntary disclose their environmental activities enjoy high level of competitiveness. Environmental accounting motivates organizations to track their greenhouse gas emissions and other environmental elements against reduction or elimination point. It was recommended that companies should adopt acceptable and uniform standards for the purpose of control and measurement of performance, and should design products which generate less waste or emission during their life cycle.

In line with the findings above, Omaliko and Okpala (2020) on environmental disclosures and dividend payout of firms in Nigeria employed regression model and found that environmental friendly firms pay higher dividend.

This agrees with the findings of Nwaiwu and Oluka, (2018) study was on environmental cost disclosure and financial performance of oil and gas in Nigeria. Time series data were collected from annual financial reporting and economic review of Central Bank of Nigeria; Pearson product moment coefficient of correlation and multiple linear regression analysis with the aid of special package for social sciences (SPSS) version 22. The econometric results reviewed adequate disclosure on environmental cost, compliance to corporate environmental regulations have positive significant effect on financial performance measures. Thus the study recommended regulatory enforcement for adequate environmental cost disclosure and proper reporting. Management of oil and gas companies in Nigeria should develop a well-articulated environmental costing system in order to guarantee a conflict free corporate atmosphere for improved corporate performance.

Olusola, Olayinka and Ayodele (2020) on the same note assessed how profitability and liquidity status of firms influence their environmental reporting. The study employed Ex-post Facto Research Design and made use of secondary data sourced from annual reports and accounts of sampled firms. A total of 23 firms were selected from 67 manufacturing firms quoted as at December 2018 financial year end using Proportional Sampling Technique. Regression model was used to analyze the data in order to test the hypothesis at 5% level of significance. The result of the analysis showed that profit after tax as proxy for profitability significantly affect environmental sustainability reporting practices of quoted manufacturing firms while earnings per share has a positive relationship but insignificant effect on environmental sustainability reporting. The result for liquidity ratio shows negative and insignificant relationship with environmental sustainability reporting. This study therefore concludes that when considering the influence of financial performance determinants on environmental reporting practices, factors like profitability in terms of profit after tax is significant. It is suggested that the management team of manufacturing firms show more concern about environmental sustainability and its report thereof because firms financial constraints in the area of liquidity and profitability is not a limitation in portraying themselves as environmentally responsible entities.

The findings above is not in tandem with the findings of Ahmad, Simon and Mohammad (2017) who examined the impact of environmental disclosure on performance of cement and brewery companies in Nigeria. Using regression model, the findings of the study indicate that larger companies disclosed more environmental information because firm size influence the extent of environmental disclosure. Return on Asset (ROA), Return on Equity (ROE), and Earnings per Share (EPS) were used as proxies for measuring performance. Also, the empirical result indicates that quantitative environmental disclosure has a positive but insignificant effect on ROA and EPS respectively.

The findings above disagrees with the findings of Osemene, Kolawole and Oyelakun (2016) who on considered the effects of environmental accounting practices and sustainable development on the performance of Nigerian listed manufacturing companies. Using regression model, the study found a significant positive relationship between environmental accounting and returns on equity (ROE) of thirty-six quoted companies randomly selected in Nigeria. Also, Huey Shi Tho and Boon Heng Teh (2016) examined the relationship between environmental disclosure and financial performance of public listed companies in Malaysia. Content analysis approach was adopted to determine the quantity and quality of environmental disclosures in the annual reports of 100 companies listed on the Main board of Bursa Sarhan Malaysia for the year 2009 till 2013.The result showed that only the quality of the environmental information has positive relationship with companies' earnings per share (EPS).

Obida, Owolabi, Enyi and Akintoye (2019) empirically studied environmentally disclosure practices on stock market returns volatility with concentration in the manufacturing sector. The study focused on disclosure practices that will have uncertainty effect on the returns expected by shareholders. Their study found that variables of financial disclosure considered have significant impact on the volatility of returns as positive reports will have positive effects on investors' decisions and expected returns, while negative disclosure will have adverse effect of investors' decision on their investments. While they considered disclosures practices and volatility of returns, this study focused on environmental accounting practices and share value of manufacturing food and beverages companies.

Oyedokun (2019) empirically considered environmental accounting disclosure and firm value with reference to industrial goods companies. The study considered non-financial and financial indicators against disclosure practices. The dependent variable was Tobin's Q and measured total assets. Using regression model, the study found that environmental disclosures practices impacts assets of the firms.

The finding above disagrees with the findings of Dike and Micah (2018) who studied environmental accounting practices and sustainable development in Nigeria. Data for the study was obtained from 34 companies with environmental accounting practices. The study was descriptive in design. Using OLS, it was found that the environment is not favorable to manufacturing firms which have negative effect on sustainable development. Sequel to the finding above, the study recommended that firms should establish efficient production of products with reasonable rates without harmful effect on sustainable development, will result into the reduction of environmental effect and have positive effect to increasing profitability.

Also, Yahaya (2018) studied the impact of environmental disclosure practices on the financial results of listed environmental sensitive firms in Nigeria. The study proxy financial performance using return on assets while environmental reporting was measured using green reporting index. Empirical result using regression model showed that environmental management activities and financial performance have positive relationship.

Endiana, Dicriyani, Adiyadnya and Putra (2020) examined the effect of green accounting on corporate sustainability and financial performance of manufacturing firms in Indonesia. The sampling method used was purposive sampling, while the research sample consisted of 38 companies that had followed PROPER and were indexed on the IDX. Data were analyzed using the Structural Equation Modeling (SEM) method known as the Partial Least Square (PLS) method. The results of this study indicate that manufacturing companies in Indonesia are able to implement green accounting by allocating appropriate environmental costs by earmarking a portion to carry CSMS implementation so as to improve financial performance. Indonesian should consider manufacturing companies that have good rankings in the evaluation program for corporate performance ratings in environmental management run by the Indonesian Ministry of Environment are in a position to generate customer loyalty, especially in financial performance.

3. Methodology

This study adopts *Ex-Post Facto Design*. This was adopted based on the fact that our data is secondary data that exists already which cannot be manipulated or controlled. The population of the study consists of the entire 13 firms quoted under Industrial Goods Sector of Nigerian Exchange Group (NGX) as at 2022 business list covering from 2016-2020. The use of quoted Industrial Goods Sector Firms on Nigerian Exchange Group (NGX) could be justified based on the fact that there is no known study which had concentered on green accounting and Sustainability with reference to Industrial Goods Sector of NGX to the best of our knowledge. Out of 13 firms that formed our sample size, 1 firm has empty financial information within the period under study (*Austin Laz Plc)* which was removed. The selected firms range from Cutix Plc, Dangote Plc, Grief Plc, Berger Paints Plc, Meyer Paints Plc, Lafarage Plc, Beta Glass Plc, Premier Paints Plc, Notore Chemical Plc, Bua Cement Plc, Cap Plc to Triple Gee & Company Plc.

Based on this, a total of 12 firms formed our sample size with 60 observations. The data were obtained from the Annual Reports and Accounts of the sampled firms. OLS Model was employed to examine the impact of Green Accounting Disclosures (WMD and PC&ERD) on Firms Sustainability measured using Kinder Lydenberg Domini (KLD) social-environmental performance rating system.

The collected data were analyzed with the aid of STATA 15. Variance Inflation Factor (VIF) was explored in order to determine if there is a multi-colinearity existence or auto correlation of the regressors.

3.1. Operationalization and Measurement of Variables

3.1.1. Dependent Variable

The dependent variable in this study is organizational sustainability and was measured using Kinder Lydenberg Domini (KLD) social-environmental performance rating system and the content analysis method of data collection as used by Uwuigbe (2011), Omaliko and Okpala (2020), Omaliko, Nwadialor and Nweze (2020). For this purpose, a score of (1) was awarded if an item was reported; otherwise a score of (0) was awarded ***(See Appendix 1).*** Consequently, a firm could score a maximum of 20 points and a minimum of 0. The formula for calculating the reporting scores by using these 20 attributes ***(See Appendix 1)*** is expressed in a functional form below:

$$\mathbf{RS} = \sum_{i=1}^{20} \mathbf{di}$$

Where:
RS = Reporting Score
di = 1 if the item is reported and 0 if the item is not reported
i = 1, 2, 3.... 20.

3.1.2. Independent Variable

Independent variable was captured using Waste Management Disclosure (WMD) and Pollution Control and Environmental Remediation Disclosure (PC&ERD).

Waste Management Disclosure (WMD) was measured using a dichotomous procedure by (GRI) which was applied in scoring the items whereby specifically, a “1-point” score was awarded for each item that is disclosed in the annual report and otherwise, a “0-point”. Then, the sum of scores of all items was computed. The WMD score for the company is derived by calculating the ratio of actual sum of scores awarded to a company to a maximum of 5 years. See Appendix 2

Pollution Control and Environmental Remediation Disclosure (PC&ERD) was measured using a dichotomous procedure by (GRI) which was applied in scoring the items whereby specifically, a “1-point” score was awarded for each item that is disclosed in the annual report and otherwise, a “0-point”. Then, the sum of scores of all items was computed. The PC&ERD score for the company is derived by calculating the ratio of actual sum of scores awarded to a company to a maximum of 5 years. See Appendix 2.

3.2. Model Specification and Justification

The study adapted and modified the model of Adegbie, Ogidan, Siyanbola and Adebayo (2020) in examining the impact of green accounting disclosures on sustainability of manufacturing firms in Nigeria as shown below;

Adegbie, Ogidan, Siyanbola and Adebayo (2020):
MPS = β_0 + β_1SMD + β_2WMD + β_3EPD + ε

The modified model for the study is shown as thus;
SS = β_0 + β_1WMD + β_2PC&ERD + ε

Where:
SS = Sustainability
WMD = Waste Management Disclosure
PC&ERD = Pollution Control and Environmental Remediation Disclosure
ε = error term

4. Data Analysis and Results

Table 2: Descriptive Statistics

	SS	WMD	PC&ERD
Mean	2.138	1.9835	1.5975
Std. Dev.	.5245912	.4497267	.7563365
Maximum	6.3	1	1
Minimum	0	0	0
Observations	40	40	40

Source: Researcher's Computation (2022).

Table 2 shows that on the average, in a 5-year period (2016-2020), the listed industrial goods firms in Nigeria were characterized by positive sustainability (SS) value of 2.138. This is an indication that the entire industrial goods firms in Nigeria have positive sustainability value with a standard deviation value of .524912. The average waste management disclosure (WMD) for the sampled firms was 1.9835 with a standard deviation value of .4497267. This means that firms with WMD values of 1.9835 and above are sustainable. There is also a high variation in maximum and minimum values of WMD which stood at 1 and 0 respectively. This wide variation in WMD values among the sampled firms justifies the need for this study as the researcher assumes that firms with higher WMD values are more sustainable than those firms with low WMD values.

Pollution Control and Environmental Remediation Disclosure (PC&ERD) on the other hand was characterized by a mean value of 1.5975 with a standard deviation value of .7563365. This means that firms with PC&ERD values of 1.5975 or more are sustainable. Also, there is also a high variation in maximum and minimum values of PC&ERD which stood at 1 and 0 respectively. This wide variation in PC&ERD values among the sampled firms justifies the need for this study as the researcher assumes that firms with higher PC&ERD values are more sustainable than those firms with low PC&ERD values.

Table 3: Collinearity Statistics

. estat vif

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 Variable | VIF 1/VIF
-------------+---------------------
 PC&ERD | 1.07 0.934528
 WMD| 1.07 0.934528
-------------+---------------------
 Mean VIF | 1.07
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From the table above, the TV ranges from 0.934528to 0.934528 which suggests non multi-collinearity feature. The VIF which is simply the reciprocal of TV ranges from 1.07 to 1.07 also indicates non multi-collinearity feature.

4.1. Test of Hypothesis

Table 4: Result on Impact of Green Accounting Disclosures on Sustainability of Manufacturing Firms in Nigeria.

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 Source | SS df MS                         Number of obs = 60
-------------+-----------------------------  F (2, 57) = 7.34
 Model | 2.19797209 2 1.09898605             Prob > F = 0.0144
 Residual | 8.53466786 57 .149731015         R-squared = 0.6709
-------------+-----------------------------  Adj R-squared = 0.6123
 Total | 10.7326400 59 .1819091525           Root MSE = 0.4802
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SS	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
WMD	.5322619	.1768949	3.01	0.005	.1738387	.8906850
PC&ERD	.1088690	.0105183	10.4	0.018	.2240095	.2022358
_cons	1.099650	.3562867	3.09	0.004	.3777449	1.821556

Source: Result output from STATA 15.

4.2. Discussion of Findings

The result of the analysis of the study using OLS Model is expressed as follows:

H_{01}: Waste Management Disclosure has no significant impact on Sustainability of Manufacturing Firms in Nigeria. In view of the above analysis as shown on table 4, the result shows that there is a significant and positive relationship between waste management disclosure and sustainability of listed industrial goods firms in Nigeria. With a P-value of 0.005, the test is considered statistically significant at 1% level. This could be verified with the coefficient of correlation of 53% which indicates that waste management disclosure ensures corporate sustainability by 53%. Thus implies that firms' that comply with environmental laws are more sustainable since such firms' have the support of the environment. Based on this, we rejected the null hypothesis and accepted alternate hypothesis which contends that waste management disclosure has significant impact on sustainability of manufacturing firms in Nigeria. The implication of this is that environmental friendly firms make higher returns. This agrees with the a priori expectations of Eze, Nweze and Enekwe (2016), Nwaiwu and Oluka (2018) who found significant and positive relationship between environmental disclosures and firms' performance. However, the finding of this study is not in consonance with the study of Riyadh, Al-Shmam, Huang, Gunawan and Alfaiza (2020) who found that environmental disclosures is negatively associated with firm performance.

H_{02}: Pollution Control and Environmental Remediation Disclosure have no significant impact on Sustainability of Manufacturing Firms in Nigeria. In view of the above analysis as shown on table 4, the result shows that there is a significant and positive relationship between pollution control and environmental remediation disclosure and sustainability of listed industrial goods firms in Nigeria. With a P-value of 0.018, the test is considered statistically significant at 1% level. This could be verified with the coefficient of correlation of 0.108% which indicates that pollution control and environmental remediation disclosure ensure corporate sustainability by 10.8%. Based on this, we rejected the null hypothesis and accepted alternate hypothesis which contends that pollution control and environmental remediation disclosure have significant impact on sustainability of manufacturing firms in Nigeria. The implication of this is that firms' that comply with environmental laws make higher returns since such firms' have the support of the environment. This is in tandem with the study of Osemene, Kolwole ans Oyelakun (2016), Oyedokun (2019) who found that environmental disclosures is linearly and positively related to firms' performance. On the contrary, Ahmad, Simon as Mohammad (2017) found an insignificant relationship between the variables.

5. Conclusion

The study having developed a model fit on green accounting disclosures using (WMD and PC&WMD) captured that WMD and PC&WMD have joint effect on firms' sustainability. Based on this, the study concludes that green accounting disclosures ensure sustainability of listed manufacturing firms in Nigeria.

5.1. Recommendation

Based on findings of the study, the following recommendations are suggested:

1. The study established a positive association between waste management disclosures and firms sustainability. Thus, it was suggested that firms should have positive disposition towards environmental friendly practices and also disclose more of this information in their annual reports on her commitment of business to contribute to sustainable economic development as the level of this information disclosure has impact on firm's sustainability.

2. Companies should design products which generate less waste, pollutants, toxic or emission during their life cycle. This can be carried out through life-cycle analysis and should also be incorporated in the financial reporting of such firm for financial statements users' consumption. With this development, the sustainability of such firm is ensured.

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Appendix 1

Table 5: Twenty Testable Social-Environmental Performance Items

S/N	Environmental	Energy	Research & Development	Employee Health and Safety
1	Environmental Pollution	Firms Energy Policies	Investment in Research on Renewal Technology	Disclosing Accident Statistics
2	Conservation of Natural Resources	Disclosing Energy Savings	Environmental Education	Reducing or eliminating Pollutants, Irritants, or Hazards in the work Environment
3	Environmental Management/ Environmental Policies	Reduction in energy Consumption	Environmental Research	Promoting Employee Safety and Physical or Mental Health
4	Recycling Plant of Waste Products	Received Awards or Penalties	Waste Management/Reduction and Recycling Technology	Disclosing Benefits from increased Health and safety Expenditure
5	Air Emission Information	Disclosing increased Energy Efficiency Products	Research on New Methods of Production	Complying with Health and Safety Standards and Regulations and Establishment of Educational Institution

Source: Adapted from (Hackston & Milne, 1996 & Adler, 1999)

Appendix 2

Table 6: Guidelines on Content Index (GCI)

S/N	Waste Management Disclosures	Pollution Control & Environmental Remediation Disclosures
1	Recycle Plants, Waste Products	Energy Consumption, Toxic or Hazardous Materials
2	Energy Policies	Research on new Methods, Environmental Education
3	Energy Efficiency	Water Pollution, Air Emission
4	Waste Management	Recycling of Products, Pollutants
5	Received awards or penalties	Environmental Policies, Environmental Remediation

Source: Adapted from Global Reporting Initiative (GRI) Environmental Disclosure Requirements